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WE understand that the February meeting of the Institute of Mining Engineers will be held at Scranton, Pa. The plan of holding this meeting at Boston has been abandoned, by reason of the severe illness of President RICHARDS, who is now slowly recovering strength, but will be for some time unable to give attention to such distracting matters as the preparation for a meeting in his own city would involve. It is, however, believed that he will be able to attend the Scranton meeting. A preliminary circular will shortly be issued by the Secretary of the Institute.

IN our review, last week, of Dr. HUNT'S essay on mineralogical classification, we said that he obtained the atomic from the molecular weights by *multiplying* the latter, etc. The context, as well as common sense, shows that *dividing* was the operation intended. We have not the necessary impudence to charge this error to the compositor or the proof-reader. It was a freak of the editorial pen, and must be classified with what the late Mr. RICHARD GRANT WHITE denominated heterophemy, or the actual utterance of a thing with the intention to utter its opposite.

WE have been intending, for some time past, to notice the new departure in civil engineering of the Massachusetts Institute of Technology. The changes which have been made in the course consist in a wider range of optional lines of study, and the more complete and thorough development of the training and instruction on such lines. Perhaps the most important departments thus affected are those of railroad, hydraulic, sanitary, and bridge engineering. To take the first as an example, the subject of roads and railroads is treated in three lectures a week throughout the third year of the school course; and there is in the fourth year an optional advanced course. The student of railroad engineering as a specialty is instructed in all the general and fundamental engineering studies, but not in hydraulic or sanitary engineering. In his specialty, he studies the subjects of reconnoissance, preliminary work, location-curves and turn-outs, calculation and measurement of earth-work and setting of slope-stakes, tunneling, construction of culverts, trestles, and masonry, permanent way (ballast, ties, rails, frogs, etc.), rolling-stock, motive power, rock-drills and explosives, maintenance, transportation, administration, the history of railroads, and the relation of railroads to the state. We are far from supposing that a thorough expert knowledge of these things can be obtained at school. But it can not fail to be good for a young engineer to gain such a wide survey of his chosen field. And the same is true of other special branches of engineering.

The new plan of the Massachusetts Institute of Technology recognizes the impossibility of teaching all these branches in a single four years' course, and hence, after laying the general foundations, mathematical, mechanical, etc., it permits the student to pursue his specialty with more exclusion and thorough devotion than has hitherto been practicable. We applaud this as a wise and useful innovation ; and we congratulate Mr. GEORGE F. SWAIN, the Associate Professor of Civil Engineering, who has been, since Professor VOSE'S resignation, in charge of the department, and to whom, we presume, the credit is due. *

A VERITABLE "boom" has set in in the long neglected South. For many years, the recognized magnificent natural resources of that part of the country were neglected and discredited, but now the danger is all the other way. On the solid foundation of the ability to produce the cheapest iron in the United States, and with the best grazing land on the continent, it is natural and proper that an enormous appreciation of nearly all values should come when these resources were developed.

The danger now is, that the values of good enterprises will be exaggerated beyond all possibility of earning fair dividends, and a thousand "wild-cats" or worthless things will float in on the "boom" wave. It is to the interest of the South, that worthless enterprises be promptly exposed and killed ; and its every friend and well-wisher, among whom we enroll ourselves, should promptly denounce what will bring discredit on her enterprises, while aiding and encouraging the investment of capital in the substantial development of her many magnificent resources.

The following press telegram from Nashville yesterday shows how the boom is growing :

"The organization of many syndicates, with millions upon millions of capital, for the development of coal and iron lands in Tennessee and Alabama, together with the fact that immense fortunes have been made recently by original investors, has caused much excitement throughout the South, especially in the States where most of the operations have been and will be conducted. Real estate has rapidly risen in value, and owners of desirable property are holding it for fancy prices. Great tracts of land have been purchased recently, and negotiations are pending for other vast fields of coal and iron. Eastern capital is flowing freely into Tennessee and Alabama, and men of wealth from these States are now in New York City making arrangements to secure enormous sums with which to carry out projected schemes. Speculation in Southern stocks has been remarkably large for the past few days, and as most of the deals have proved very successful, the excitement is at fever heat. Tennessee Coal and Iron stock, which sold at 20 cents last spring, has risen at a rapid rate within the last few weeks. It opened to-day at 103, and closed at 113. Sheffield, which was dull during the summer at 30 cents, ruled to-day at 250. South Pittsburg is in demand, having shown much firmness of late. It was quoted at 26 a few months ago and closed at 78 to-day. Alabama & Tennessee has also advanced greatly, and is held at 200. There is as much local excitement over the speculation in these stocks as there was over the marriage associations that flourished in the South four years ago."

THE REVIVAL OF MINING.

The great increase in activity in the dealings in mining stocks lately, not only in this city, but in all centers where these securities are dealt in, proves that the attention of the general public is again attracted to this class of investments. Since the collapse of the last mining excitement in 1880–81, mining, as a speculative undertaking, has not been in favor, and the "wild-cat" features and overvalued enterprises that formed the crest or foam of the last mining tidal wave lost their attractiveness and subsided into deserved oblivion and "innocuous desuetude." Legitimate mining, however, has in the last few years established itself more firmly than ever in the favor of prudent and careful business men, as a proper and profitable undertaking, provided it is conducted as any other legitimate business would be, that is to say, under the direct supervision of those whose capital is invested.

The result of this prudence has been vastly to increase the number of remunerative mining enterprises, by the introduction of better and cheaper methods of treating the ores, and more perhaps by the enforcement of greater economies of management. There are probably to-day

more actual dividend-paying mines in the United States, in proportion to the whole number of mines operated, than at any previous time in the history of mining. The increased interest exhibited by the investor is based, therefore, on perfectly legitimate reasons, and is not the result of the excitement due to any unreasonable "boom."

After the loss of faith in mining stocks, due to the failures and swindles of 1880 and 1881, the prices of legitimate mining shares fell far below what was their intrinsic value, based on their interest-paying capacity, and have remained so until very recently. It is the gradual perception of this fact that has turned the attention of the public once more in that direction and made it desirous of taking part in these undertakings.

While we greatly rejoice to see such an evident return of confidence to this special line of industry, we sincerely hope and trust that the public will not forget the lessons taught or the experiences so dearly purchased during the last mining excitement. Let them remember that the traditional "nine lives" of the ordinary feline genus are as nothing, when compared with the liveliness that, under the slightest provocation or encouragement, will at once reanimate the seeming corpses of the "wild" species. The greatest caution should be shown by the would-be investor to thoroughly examine the whole character and condition of the mining property before venturing his capital in it, and all mining engineers and experts should show even greater caution than ever in the statements they may be called upon to make. Having once more, as the result of many years' steady, hard work, regained the confidence lost by the errors and failures of the past, it is to be hoped that the mining profession may be able to hold it continuously in the future by prudence and reliability in advice; and that this revival in the industry is but the commencement of a steady and healthy growth that will place mining investments where they belong, when prudently undertaken and honestly managed, namely, as the most lucrative investments that capitalists can make. The following table illustrates the enormous increase in mining stocks within the past three months. Many of these stocks are now at figures far beyond their intrinsic value:

	Oct. 1	Nov. 1.	Dec. 1.		Oct. 1.	Nov. 1.	Dec. 1.
Barcelona	.07	.....	.17	Little Pittsburg	.45	.52	.80
Belle Isle, Ne	.32	.45	.90	Mexican	433	1.30	11.25
Best & Belcher	.60	2.30	22.00	Mono	2.65	2.65	3.50
Bodie Cons	2.70	2.55	3.90	Navajo, Ne	.62	.95	1.50
Bulwer	1.80	1.70	2.00	North Belle Isle	2.10	6.50	.....
Caledonia, Da	1.16	.....	1.65	Ophir	.90	3.75	13.75
Castle Creek	.04	.09	.21	Plymouth	16.13	16.25	16.38
Central Arizona	.....	.07	.26	Rappahannock	.09	.10	.24
Chrysolite	.53	.58	.77	Red Elephant	.....	.01	.12
Cons. Cal. & Va	2.40	7.25	41.00	Savage	1.90	2.70	10.00
Con. Pacific	.....	.10	.46	Sierra Nevada	.27	1.30	14.00
Deadwood	2.50	2.10	3.40	Silver Cliff	.05	.....	.17
Hale & Norcross	1.00	1.55	7.00	Sutro Tunnel	.08	.14	.27
Lacrosse	.07	.09	.15	Union Con	.27	.85	9.50
Leadville C. Co	.37	.43	.68				

MARTIN CORYELL.*

That the death of MARTIN CORYELL, which occurred at Lambertville, New Jersey, on Monday morning, November 29th, touched the sympathies of a wide circle of professional associates and personal friends, was amply testified by the gathering at the funeral services on Friday. Like his distinguished friend and neighbor, the late ASHBEL WELCH, Mr. CORYELL was one of those pioneers in American engineering to whom we owe the great railway and canal systems which lie at the base of our national prosperity, and who have consequently enjoyed the respect and esteem of their successors of the present generation.

MARTIN CORYELL was born July 20th, 1815, at New Hope, Bucks County, Pa., and was educated principally in the schools of his native town and of Lambertville, New Jersey, to which place he returned for permanent residence, fifty years later. With the exception of a brief period in youth, during which, to restore his failing health, he learned and practiced for a few months the carpenter's trade, and another brief period, later in life, when he read law for a time in the office of B. H. BREWSTER, of Philadelphia, afterward Attorney-General of the United States, Mr. CORYELL may be said to have spent his life as an active civil and mining engineer. Even these two episodes can scarcely be said to have been deviations from that profession, since they served to give him more thorough preparation for constructive and administrative work.

The Delaware Division Canal, the Raritan Canal, and the Brunswick Canal are among those upon which Mr. CORYELL was employed. For the Raritan Canal Company, under the superintendence of ASHBEL WELCH, he located the greater part of the Belvidere Railroad (now the Belvidere division of the Pennsylvania Railroad), and directed its construction from Trenton to Lambertville. He was also active as a mining engineer, being one of the early pioneers of mining in the Lake Superior copper region, and had much to do with the development of the Hazleton coal-field and the railroad which has since expanded into the Lehigh Valley system.

In 1862, he removed to Wilkes-Barre, where in 1864 he became manager of the Warrior Run Mining Com pany. One of the editors of the ENGINEERING AND MINING JOURNAL gratefully remembers the cordial generosity with which, as a young surveyor and mining engineer, commencing at Wilkes-Barre the practice of his profession, he was received by Mr. CORYELL, who put at his disposal office, books, instruments, and wise advice and substantial encouragement in the way of employment. This kindness to younger men in the profession was, throughout life, characteristic of him. He took a lively interest in their success, and aided them in every way.

Besides the more prolonged engagements to which we have alluded, Mr. CORYELL visited as an expert the mining regions of many States, and became familiar with the greater part of what was, during his prime, the settled portion of the United States. If we are not mistaken, he did not enter the field in and beyond the Rocky Mountains; but he extended his labors to Nova Scotia, and spent a season in the thorough study of the coal-beds of Cow Bay, Cape Breton.

In April, 1871, while still residing at Wilkes-Barre, he united with R. P. ROTHWELL, then of that city, and ECKLEY B. COXE, of Drifton, Pa., in issuing a circular, the result of which was the meeting of May 16th, 1871, organizing the American Institute of Mining Engineers. The extraordinary growth of that society, from a score of members at the outset to more than 1500 in fifteen years, is a familiar story.

To the founders of the Institute, this instant and great success was a matter of equal surprise and pleasure. The momentum seemed to come as if by miracle; but the *direction*, without which momentum would have been useless or disastrous, was happily given at the beginning by one thing more than by any or all others—namely, the hearty and fraternal co-operation of veterans trained by long experience with the young graduates of schools. DAVID THOMAS, the first President, and MARTIN CORYELL, the first Secretary of the Institute, worthily represented this generous feeling; and although, as the labors of their offices increased, they gave way to younger men, yet they remained in office long enough to impress upon the new society a character of harmony and catholicity which it has never lost. There is perhaps no other technical body in the proceedings of which men of practice take part with so little embarrassment, and men of school education with so little conceit, and both with so little jealousy of each other. And as the men of practice make, in such a case, undoubtedly the more valuable contribution, they are entitled to the larger share of credit.

After Mr. CORYELL'S two years' service as secretary, he was for three years a manager of the Institute—in that stage of its history, let it be remarked, when the machine did not run itself, and the office of manager was less like a sinecure than it has since become. The formation of wise rules and the accumulation of safe precedents cost a good deal of patient thinking and planning. Mr. CORYELL'S contributions to the *Transactions* are confined to a few brief papers in the early volumes. Growing age and infirmity forbade him to undertake more extended labors of that kind; but he maintained to the last an eager interest in the Institute, and attended the meetings whenever he could—which was, indeed, not seldom. His genial greeting was one of the pleasant things to which many of us looked forward, and upon which we now, with tearful eyes, yet grateful hearts, look back.

My own association with MARTIN CORYELL, beginning as it did with the birth of the society we both loved and served, is indissolubly connected in my thought with the history of that society for more than fifteen years. It has been to me an experience of unbroken, unvarying kindness and friendship from him. I do not doubt—nay, I know—that many other members of the Institute would bear the same testimony. There can be no more fitting end to a long and honorable career than was the benign sympathy which, from his well-earned repose and retirement, MARTIN CORYELL bestowed upon the generation that had assumed the hopes, labors, and responsibilities from which he was already in large part, and is now wholly and forever, released.

* A paper to be read at the annual meeting of the American Institute of Mining Engineers, February 15th, 1887, by R. W. RAYMOND.

CORRESPONDENCE.

[We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.
All letters should be addressed to the MANAGING EDITOR.
We do not hold ourselves responsible for the opinions expressed by correspondents.]

Comparative Efficiency of Spray and Surface-Cooled Air-Compressors.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: I regret for Mr. Gilchrist's sake, that he should have gone to the trouble to republish the air cards that accompanied my letter of October 30th. He has evidently misunderstood the cards. I had no intention of exhibiting No. 2 as illustrating adiabatic compression, but only to show the immediate rise in the pressure line, by constricting the injection. A cold cylinder subject to atmospheric radiation will *not* give an adiabatic curve, or even nearly so. In this particular case, there was no attempt made to get adiabatic compression; in fact, it was carefully avoided, for fear of damage through heat. The spray pump was not detached, but was in operation when the card was taken, though the globe valve in the suction-pipe was closed. There was doubtless a reduced quantity of water still in the cylinder.

But let us suppose that the cylinder did not radiate heat, and that no

water was present. Whether or not there had been so conspicuous a leak as Mr. Gilchrist intimates, the temperature of the air would have followed the rules of adiabatic compression. Refer to the following tables:

HEAT PRODUCED BY COMPRESSION OF AIR;

the volume at atmospheric pressure being 1 at the temperature of 60 degrees Fahrenheit.

PRESSURE.		Cubic feet.	Temperature of the air. Degrees F.	Increase of temp. Degrees F.
Atmospheres.	Pounds per square inch. Gauge pressure.			
1·00	0·00	1·0000	60·0	00·0
1·50	7·35	·7501	124·9	64·9
2·00	14·70	·6117	175·8	115·8
2·50	22·00	·5221	218·3	158·3
3·00	29·40	·4588	255·1	195·1
3·50	36·70	·4113	287·8	227·8
4·00	44·10	·3741	317·4	257·4
5·00	58·80	·3194	369·4	309·4
6·00	73·50	·2806	414·5	354·5

We see that, admitting air at 60 degrees and compressing to 58·8 pounds (practically 60 pounds), the total increase of temperature will be 309·4 degrees, and the final temperature (adiabatic), 369·4 degrees. The specifications of card No. 2, published in my letter, and reproduced in Mr. Gilchrist's, state that the temperature of the air was 108 degrees, thus clearly indicating that Mr. Gilchrist's shaded area is not a leak, and should not be transferred to card No. 1.

Since Mr. Gilchrist has described his "experimental set of jets," and admitted that the piston speed during his "investigations" was little above that of a common water pump—less than half the usual speed of air-compressors, I feel justified in refusing to accept his experiments as evidence in the case, and shall discuss them no longer. But before withdrawing, let me "draw upon the imagination of your readers." Conceive of the condition of the air near the cylinder-head, in the interior of the compressor. The advancing piston first produces a blast of wind, then a violent agitation and increasing density of medium. Mr. Gilchrist attempted to discharge fine needles of water through a perforated disk, against and *into* this medium. "Imagination" can easily depict the water dribbling down the face of the cylinder-head. The Ingersoll half-inch stream, through its greater *vis viva*, penetrates the air, and, meeting with agitation, is diffused into spray. A simple illustration of this is the fire-hose jet against the wind.

Nor does the Ingersoll jet discharge through the valves until its work of cooling is done; for the heat of compression is generated before the opening of the discharge-valves.

Now, Mr. Editor, you have published an air card from an Ingersoll compressor that shows a loss of only 3·6 per cent through heat. I challenge the manufacturers of water-jacket compressors, or any body else, to produce an air card from jacketed compressors, taken under similar conditions as to speed and volume, that will show a result equally good. I challenge the production of a card showing a thermal loss as low even as 5 per cent.

I respectfully invite an examination of the card and compressor from which it was taken. If there is a leak there, I would like to know it, for I am only seeking the truth. WILLIAM L. SAUNDERS.

NEW YORK, Dec. 1.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Much interested in the recent correspondence in the JOURNAL, regarding the efficiency of spray and surface-cooled air-compressors, allow me to corroborate that we have had in constant use for more than two years an Ingersoll air-compressor with water-injection, and during this time we have not spent one cent for its repair. This compressor has been giving such good satisfaction that (half a year ago), needing to duplicate our production, I did not hesitate to order one more of the very same kind. In regard to cylinder wear, our first compressor shows no wear after more than two years' steady run. I never had any trouble from "frozen air" in the air-pipes, and not one of the seven exhausts operated by air from our two Ingersoll compressors has shown the least sign of freezing.

LANDING, N. J., Nov. 29. Very truly yours, K. J. SUNDSTROM, M.E.,
Superintendent American Forcite Powder Manufacturing Company.

Mineral Claim Patents.—The Secretary of the Interior, on November 23th, addressed a letter to the Commissioner of the General Land-Office, changing the practice of the department in the patenting of mineral claims in a radical manner. It has been the practice for many years, when conveyancing mineral lands upon which the metal lay in lodes, to reserve from the title all town-site and other rights, thus dividing the land between the miner, who got the mineral beneath the soil, and the town-site claimant, who got the surface. Thus, the mineral claimant who came in and secured the land after the town-site had been located, sometimes for years, got what he wanted, and the owner of the surface was not disturbed. With placer mining claims, this, of course, could not be done, as the surface soil was exactly what was wanted; so, as in the case involving the town-site of Deadwood, Dak., the claim carried with it town-site rights, buildings, residences, wells, and every other sort of improvement that had been made on the land. This has caused many bitter fights between the two sets of entry-men, which were many times carried from the Interior Department to the courts, and one of them, the well-known contest of Deffleback *vs.* Hawks, was taken to the court of last resort. The Supreme Court decided in this case, a short time since, that the fee was not devisable between claimants, and that it must be "surface and depth" to either the mining or town-site claimant. This decision, although made in a placer mining case, was applied to all classes of mining claims, and the Secretary has instructed the General Land Commissioner to conform to this ruling. This, in lode as well as placer mining, will turn over all betterments upon the land to the mining claimant when awarded a claim as against the town-site claimant.

MANUFACTURE AND COST OF COKE.

Written for the Engineering and Mining Journal by F. Koerner, M.E.

The attention given to late articles in the JOURNAL on the manufacture and cost of coke proves the importance of the subject, if any proof had been needed. Whatever affects the cost of iron and steel is of moment, especially to the iron-masters and steel men of the North and East, to whom a more formidable competitor than England is looming up in the greater natural resources of Tennessee and Alabama.

The coke-oven to which I referred in the JOURNAL of October 23d was designed for the lean Ruhr coals. As to their economy, I had the proof furnished me that, during nine months, under the most rigid supervision as to weights of coal and coke, the loss of fixed carbon did not exceed ¼ of one per cent. During this time, every charge of coal (being damp after washing) and every "cake" of coke was tested for the water it contained. The coke so made was used in furnaces with the Siegen ores, and gave in every respect equally satisfactory results, in point of economy and output, with the coke from an old plant of bee-hive ovens (which since then has been replaced by the new ovens). After proving so satisfactory with the leaner coals, and it becoming important to utilize the "mine smalls" of another seam of richer coal for coke, the oven had been modified to suit that purpose, and gave, after various experiments, equally good results. In one respect, this coke proved superior to coke made from the same coal in the bee-hive: the new oven eliminated over one third more sulphur than the bee-hive had done. And such a result might, *a priori*, be expected; time being an important factor in the elimination of sulphur, the bee-hive oven being very hot only for a comparatively short time, the new oven being *continuously* very hot, from the entrance of the charge to its discharge, must give better results in this respect.

The eduction of the products of the burnt gases was effected simply by natural draught through chimneys. Critically observing the process during several months, I found that the combustion of the gases, and consequent heat of the oven walls, were much more energetic during certain conditions of the atmosphere and direction of the wind. The "coke-master" then remarked: "This charge will give excellent coke; now the ovens are working 'ideally.'" But I noticed that such very energetic action was not allowed to continue more than a few hours during any one charge; in other words, when the "fusion" of the coal had been effected, the supply of the gases heating the oven was checked; indeed, the process closely resembled that of the bee-hive, with the difference that it was under thorough control. To make the process entirely independent of atmospheric influences and changes, I have added variable, automatic ventilation, which gives a chance to make the process a uniform one at all times and seasons.

The objection has been made that coke from chamber or retort ovens, necessarily cooled outside of the oven, contains more water than bee-hive coke; but in making this claim, it is assumed that nearly all the water used in cooling the coke in the latter is again evaporated, which is very far from being the case, and that the water used in case of the former is used to the point of drenching. In practice, we find that frequently water enough is allowed to flow into the bee-hive, not only to cool the coke, but to allow a stream to run from the oven-door; and when that is not the case, additional water is frequently thrown upon the coke after being drawn. As I have shown before, efficient supervision is very difficult.

When the coke is pushed out of a chamber oven on to the cooling-floor, too much water may be used here as well as in case of the bee-hive; but a plant of 100 of these ovens being only about 300 feet long, as against 1400 feet in the other case, every thing is obviously under four times better control and supervision on the part of the foreman. But to do away with all possibility of leaving any undue quantity of water in such coke, I have constructed a reservoir in which the cooling is done, admitting automatically, by extremely simple means, *only so much water as the hot coke will evaporate.*

Connecting automatic and variable ventilation with these ovens for the eduction of the burnt gases gives greatly increased facilities for obtaining the ammoniacal by-products without interfering with the process.

A great saving of labor, amounting to fully one half, I effect by the application of modified paraphernalia used, and well known, in anthracite practice, for handling and loading the coke on and into cars. Indeed, nothing has been added by me, except what has stood the test of practical application elsewhere for similar purposes.

The cost of these new ovens, and more especially that of the labor-saving additions, is very materially influenced by the conformation of the ground upon which they are built. The cost of the ovens proper will be, as compared with the bee-hive, for a like quantity of coke, from 50 to 75 per cent higher; but as a *per contra*, they will not require more than 10 per cent of the repairs of the latter.

Then as to the quality of the two cokes: The claim has been made that bee-hive oven coke was harder, and therefore better, by reason of the greater heat of the oven and consequent thorough fusion of the coke. This fusion is effected within a short space of time, probably not exceeding three or four hours. On the other hand, we find that 72-hour coke from the bee-hive is preferred to the usual 48-hour product and brings a higher price. There must, therefore, be other factors active besides the thorough fusion that is claimed.

In the new oven, both this fusion and a continued exposure to any desirable temperature are easily effected by properly adjusting the time of charging the ovens, one with another, because the escaping gases from one oven may be used for heating another, and the oven from which a charge of coke has been removed being of a high temperature, when a fresh charge of coal is put in, a large volume of gas is liberated, and this being available for an adjoining oven, it is only a question of admitting air and educting the burnt gases to produce any desired and needed temperature. These important factors are under absolute and perfect control, and the distillation of the coal and the elimination of the sulphur are effected by the combustion of these gases, and not by consuming fixed carbon.

Indeed, without consuming a large percentage of fixed carbon, it is impossible to produce an equal amount of heat in the bee-hive, as com-

pared with the oven referred to. The relative pyrometrical heating power of carbon being 2450, of carbur. hydr. 2286, and of hydrogen 2273 (see Favre and Silbermann), and taking a coal of 60 per cent fixed carbon, and 30 per cent volatile matter, of which say 20 per cent is hydrocarbon compounds, it is plain that about 30 per cent of fixed carbon is necessary for an equal number of heat-units. But it will, perhaps, be claimed that some of the gases give off heat before issuing out of the charging-hole of the bee-hive; assuming that 25 per cent of these gases do this—which will strike the intelligent observer as an impossible quantity—then there is still 20 per cent of fixed carbon necessary for an equal number of heat-units. But, again, this does not take into account the carbon passing off as carbonic oxide, burned on issuing from the charging-hole and imparting little or no heat to the oven. We see we have arrived, by an estimate based on ascertained data, at nearly the same figures that are given by Mr. Steavenson as the loss in bee-hive coking.

The flues of the new oven, serving for mixing the gases with air, effecting their thorough combustion, and thereby heating the sides and bottom of the oven, are about 200 feet long, and the combustion under perfect control; it is plain that there is but ordinary care needed to properly fuse the coal and hasten or protract the after process. If 72-hour coke has superior qualities for any purpose, then the capabilities of the new oven are very great, especially as regards the more thorough elimination of the sulphur, where time, combined with the *continuous* application of heat, is the great factor. While time enough may be allowed in the bee-hive for this purpose, the continuous application of heat is impossible, at least in the degree in which that may be done in the new oven.

Mr. Howe, in his article on coke in the JOURNAL of November 20th, as we might expect from so competent an authority, shows a thorough understanding and appreciation of this matter. He says, "I see no insuperable obstacle," that is, to bringing the coke to as high a degree of heat in the retort as in the bee-hive. During the several months in which I closely observed the working of the oven referred to, it was accomplished as often as the atmosphere and the direction of the wind were favorable. To obtain absolute and complete control at all times and seasons, it is only necessary to add mechanical ventilation, variable to suit the conditions of the process. All this is effected by simple and well-known means.

Mr. Howe, in the same spirit, continues: "But even if the temperature can not be raised as high in the retort as in the bee-hive, the retort coke may be made as efficient as the bee-hive by adapting the blast-furnace to it, and this is exactly what Samuelson and the continental smelters seem to have done." The enormous saving that can so easily be effected on the coke would greatly more than compensate for this, if it were necessary.

WILKES-BARRE, PA., Nov. 29.

DESILVERIZATION OF LEAD BY ZINC AT FREIBERG.*

By C. A. Plattner.

The Parkes process has recently been introduced at the Royal Muldener works at Freiberg, in conjunction with the Pattinson process. The latter can not be entirely dispensed with at these works, on account of the bismuth in the argentiferous lead. The combined Pattinson-Parkes plant is as follows: For the Pattinson process, there are two batteries of nine cast-iron pots, 5 feet 8 inches in diameter, 2 feet 11 inches deep, and with a capacity of 15 tons. For the Parkes process, there are two cast-iron desilverizing pots, 6 feet 5 inches in diameter, 3 feet 3 inches deep, and with a capacity of 20 tons; three cast-iron hemispherical liquation pots, 1 foot 9 inches in diameter; one refining-furnace, with a fire-brick bottom 9 feet 10 inches long, 6 feet 6 inches broad, and 1 foot 5 inches deep, for separating the zinc from the poor lead; and one cast-iron tapping-pot, 5 feet 14 inches in diameter and 3 feet 3 inches deep, for receiving the lead from which the silver has been removed. The lead containing 0·1 per cent of silver, to be treated by the Parkes process, is removed from the last Pattinson pot by means of Rösing's steam lead-pump.† Lastly, there are two furnaces for distilling the rich argentiferous crusts obtained in the Parkes process. These are air-furnaces, each containing a plumbago crucible and an iron condenser.

The mode of procedure is as follows: The refined argentiferous lead, with more than 0·1 per cent of silver, is charged into the pot of the Pattinson battery, corresponding to its percentage of silver, and is converted, by the usual method of thirds, into a rich lead with 2 per cent, and a poor lead with 0·1 per cent, of silver. The rich lead is cupelled, and the poor argentiferous lead is treated by the Parkes process. The time occupied by the desilverization is not more than twenty hours, five hours being required for the melting of the argentiferous lead and collection of the argentiferous zinc crusts, and five hours for each period of desilverization, that is, from one addition of zinc to the next. The lead from the Pattinson process, with 0·1 per cent of silver, requires at most three additions of zinc. Each charge of 20 tons of lead with 0·1 per cent of silver, requires 473 pounds of zinc, 220 pounds for the first addition, 165 pounds for the second, and 88 pounds for the third. The original proportion of 0·1 per cent of silver, and 0·004 per cent of gold, in the argentiferous lead, is reduced, after the first addition of zinc, to 0·025 per cent of silver and a trace of gold; after the second addition, to 0·002 per cent; and after the third addition, to 0·0007 per cent of silver and no gold.

The following figures, giving the results obtained by treating Freiberg leads with the maximum (0·8) and minimum (0·4) percentage of auriferous silver, show how the combined Pattinson-Parkes process compares with the simple Pattinson process hitherto in use.

1. Lead containing 0·84 per cent of auriferous silver gave, with the Pattinson process in sixteen pots: rich lead, 41 per cent, with 2 per cent of auriferous silver; commercial lead, 49 per cent, with 0·001 per cent of silver; and lead, in intermediate products, 10 per cent, with 0·2 per cent of silver. Of the gold and silver present, there was collected 97·6 per cent in the rich lead, 0·1 per cent in the commercial lead, and 2·3 in the intermediate products. The cost was 7·53d. per cwt. of argentiferous lead. With the combined Pattinson-Parkes process, with nine pots, there was obtained: rich lead, 38·9 per cent, with 2·11 per cent of auriferous silver; commercial lead, 52·5 per cent, with 0·001 per cent of silver; lead in intermediate products, 8·6 per cent, with 0·18 per cent of silver. Of the gold and silver present, there was collected 99·1 per cent in the rich lead, 0·1 per cent in the commercial lead, and 0·8 per cent in the intermediate products. The cost was 6·34d. per cwt.

2. Lead, with 0·42 per cent of auriferous silver, gave, with the Pattinson process in sixteen pots: rich lead, 20·5 per cent, with 2 per cent of auriferous silver; commercial lead, 69·3 per cent, with 0·001 per cent of silver; lead in intermediate products, 10·2 per cent, with 0·1 per cent of silver. Of the gold and silver present, there was collected: 97·6 per cent in the rich lead, 0·1 per cent in the commercial lead, and 2·3 per cent in the intermediate products. The cost was 7·04d. per cwt. of argentiferous lead. With the combined Pattinson-Parkes process, with only eight Pattinson pots, there was obtained: rich lead, 17·16 per cent, with 2·39 per cent of auriferous silver; commercial lead, 73·52 per cent, with 0·001 per cent of silver; lead in intermediate products, 9·32 per cent, with 0·08 per cent of silver. Of the gold and silver present, there was collected 98 per cent in the rich lead, 0·1 per cent in the commercial lead, and 1·9 per cent in the intermediate products. The cost was 5·53d. per cwt. of argentiferous lead.

In comparison with the simple Pattinson process, the combined process in the above two cases gave:

	1.	2.
Rich lead	2·1	3·34 per cent less.
Commercial lead	3 5	4·22 " more.
Intermediate products	1·4	0 88 " less.
Cost	18·0	21·45 " "

Instead of the twenty-seven workmen formerly required for the sixteen Pattinson pots, only twenty-two are now required for the desilverization and distillation, and the yield of rich and commercial lead per working day has increased 18·3 per cent.

* Abstract of a paper in the *Jahrbuch für das Berg- und Hüttenwesen im Königreiche Sachsen*, 1886, p. 133. From the Proceedings of the Institution of Civil Engineers of London, edited by James Forrest, Secretary.

† Minutes of Proceedings of Institution of Civil Engineers, vol. lxxxiv., p. 512.

COPPER SMELTING IN 1865.

Written for the Engineering and Mining Journal by W. H. Adams, M.E.

The commercial world has lately been reminded by the fiat of a well-known copper company (which, with American promptness and disregard of consequences, reaches into the capitalized millions of the universe) how surely this country is advancing in processes for cheaply producing the staple minerals of trade.

The effect is wider spread than appears on the surface, as it directs attention not only to methods pursued by this company in so cheapening production as to continue its policy of giving the public the benefit of low-priced copper, but to methods in use by the copper producers of the world generally, and brings home to every stockholder in mines other than of *native* copper the question of closer economy in every department, new methods of working, and radical changes in many of the processes now in use.

As a nation, we are far in advance of all others in methods of economically smelting ores of copper; and if this present bottom price for copper is to remain, bringing with it a greatly increased consumption, the sooner the lame ducks everywhere flock to our shores for our trade secrets, the happier will be their shareholders. The ease with which our 100-ton smelters are handled on first-roast low-grade ores (say, 5 per cent), and the impunity with which a large portion of the charges made up of green "fines" are fed to these monsters; the starting and stopping at pleasure; and the uniform quality of products, must now be investigated, if never before deemed worthy of examination.

But few of the present generation of American metallurgists are aware that but twenty years have passed since the first radical changes were made from old world practice, and that they were made in Canada, in working the same ores now so successfully treated near New York by Nichols & Co. and the Orford Company.

Your publication of late of several valuable contributions to the literature of copper will give to the world many new ideas, which the American companies are and have been utilizing to great advantage for some time. May I add to these some fragments from old note-books relative to the early history of the Capelton pyrites deposits in Canada? deposits never fully written up, though deserving especial mention as the location whence came the ores to first practically settle the question of the manufacture of acids from pyrites.

In 1865-66, Crocker Brothers, of Taunton, Mass., and the Point Shirley Works, Boston, were the only American smelters of copper ores using upright or stack furnaces, the type so rapidly perfected and in general use, which alone I refer to in this article.

These furnaces were modeled from those in use in England, Germany, Spain, Norway, etc. (illustrated in all text-books), were built of red brick, usually 6 feet by 8 feet and from 10 feet to 12 feet high, topped out with a low chimney, and held together by iron stay-bars. The furnace proper was fire-brick, 2 feet by 4 feet inside, with breast of tiles held in place by cross-bars and springs. The bottom of the furnace was 3 feet from the floor level, and blast was supplied through one tuyere opening placed 8 inches above the bottom at the back of the furnace. Outside the furnace front, crushed coke and fire-clay ("steep") were banked up compactly, and basins were scooped therein, into which the molten slag ran for separation from any overflowing matte. After completion, these furnaces, costing perhaps $200, were slowly dried out, and the week's campaign started by firing with coke Sunday night. Monday morning, at seven, blast was put on and ore-charging regularly followed until Saturday at four P.M., when the furnace was completely cleaned out for renewal. The charges of fuel and ore (1 : 4) were carried up in small boxes and thrown into the furnaces over the breast tiles, the burden above the tuyeres being about 5 tons.

The slag, after leaving the "steep," flowed into sand-beds, and was removed in slabs when cool. The matte or regulus gradually formed a basin inside the furnace, by eating out the sides and bottom brick, and then overflowed into the "steep" basins, being tapped from them into sand-beds or ladled into molds. The product therefore was more or less

impure by mixture with slag and sand. At least once a day, the entire "steep" front was removed, the matte was drawn from the interior of the furnace, a new front made, and blast continued. The campaign of the week was satisfactory if 40 tons of ore were smelted, or 40 ore, 10 slag, 10 fuel equal 60 tons put through in 5½ days. The matte was from 20 to 25 per cent from low-grade ores, and the slags carried from 1½ to 3 per cent of copper.

With this type of furnace as a model, and with men trained in the Boston works, Gen. H. P. Adams, of New York, inaugurated and successfully worked out entirely new and radical changes in smelting during the period from 1865 to 1871, notes of which are now for the first time published, but the progressive steps of which were witnessed by many scientific men at the time.

The ores were mined from the Hartford Company's shafts Nos. 1, 3, and 5 at Capelton, Canada, were heap-roasted in the ordinary manner, and carted two miles down the mountain to the smelting-works erected by him on other property of the company.

The fuel (coal and coke) was teamed eight miles from Lennoxville station, on the Grand Trunk Railroad, and matte, blister copper, and rich ores shipped from the same station.

The works were placed in a central position to all the company's property, to water, and fuel for steam purposes; and these pen sketches will show that all the conditions for cheap and rapid handling of ores and fuel were fully met, even at that date, although, had it been possible to purchase land nearer to Capelton, the item of transportation would have been much lessened.

The smelting building was 120 feet by 40 feet and 12 feet clear between floors. A building in the rear contained the 70 horse-power boilers, engine, blowers, smith-shop, etc., and an addition to the east side was for 8 matte stalls.

The ore and fuel were thrown through the roof doors, as shown, and stock of 200 tons could be carried under cover on the level with the feeding-doors. Water was brought in wooden logs, bored on the place, from a reservoir 100 feet above. Slags were disposed of on a short run; matte was sent down to the stalls, and down to wagons for shipment.

The smelting building was completed with four stacks, three for ore and one for matte-smelting. The latter, however, was never used, as the others were equal to all demands.

Each furnace was expected to run 15 tons of roasted ore daily, and was built on red brick piers, 7 feet high, with outside measurements, 7 feet by 9 feet; hight to feed-doors, 14 feet; chimney raised above the roof, and all work securely bound by iron stay-bars. Inside the piers, the furnace proper was of fire-brick with expansion-joint in contact with red brick. The bottom of the furnace was 3 feet above the floor, and the breast was built of tiles 5 feet above the bottom, the front being closed above that point. *Two tuyeres* were placed in line at the back 8 inches above the bottom of the furnace.

Outside the furnace front, three cast-iron plates formed a box to hold the "steep" basins, and had lips for the overflow of the slag, and tap-holes for matte on each side. The matte was received in rectangular shallow cast-iron molds, free from dirt or slag, and easily cooled by elevation on rails.

Slag was removed in ordinary cumbersome wagons.

Two of these furnaces ran from 12 to 18 tons of ore daily for 5½ days, and were pulled out for repairs according to the prevailing fashion. Three months' training of the men developed the fact that the damage to the lining of the furnace took place the first three days, and it therefore was deemed possible to continue the campaign; but here came the difficulties of custom, training, stubbornness, etc., to overcome, and a struggle it was for weeks. A run of *three weeks* was made by bribes, threats, and withdrawing one furnace for rebuilding purposes, which demonstrated the principle and gave encouragement for renewal of one furnace with 3 *tuyeres in the back*.

These tuyeres were cast in Sherbrooke, were 3 feet long, 15 inches across base, 2 inches across nose, and 2 inches water space. They were set thus: $\begin{smallmatrix} & o & \\ o & & o \end{smallmatrix}$, and although much trouble was occasioned by the burning out of the tuyeres, causing explosions, *sows*, etc., yet this furnace *ran six weeks* with an average daily consumption of 23 tons of ore (fuel, 1 : 8).

Another furnace, changed to same pattern, *ran eight weeks* with every condition better, and part of this time ran at the rate of 35 tons of ore daily.

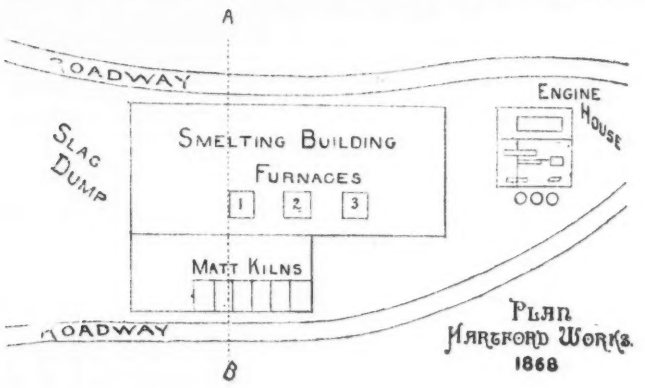
These two furnaces were run for nearly a year with improvements in tuyeres, tools, tapping facilities constantly going on. The fuel question was our principal one, and experiments begun with gas coke from Montreal, followed by coal and coke from Newcastle, England, by way of Quebec. American coals and coke from Portland were ended by the trial of a cargo of coals from Rhode Island, which contained the fluxing properties to essentially fit them for this class of smelting; for be it remembered that but one class of ores was used, and if these ores were not self-fluxing, there were no others to add to them.

My notes show some remarkable results with this fuel, alone or mixed with a little hard coke on rainy days. Costs were lower than with any other fuel, slags and matte more uniform, and runs of weeks of 1 : 10, with production of "blister" each daily tap and clean-out, are frequently noted.

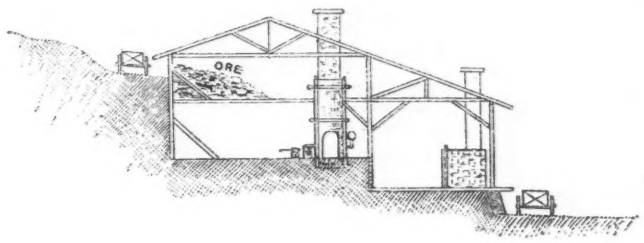
The work became so regular that No. 2 furnace was torn down and rebuilt for 5 tuyeres placed in the back, thus: $\begin{smallmatrix} o & & o \\ & o & \end{smallmatrix}$ which furnace ran with all ease from 40 to 50 tons daily. With very dry, well-roasted ore, 60 tons have been put through in twenty-four hours; but unfortunately for such a demonstration of rapid work as the well-built plant deserved, the weathering and transporting of the ore left it nearly always in bad condition, wet, fine, poorly roasted, etc. Up to the time of closing the works in the fall of 1869, these furnaces were an example of an advance in smelting unequaled and unknown elsewhere. They were visited by a large number of scientific men from all parts of the world.

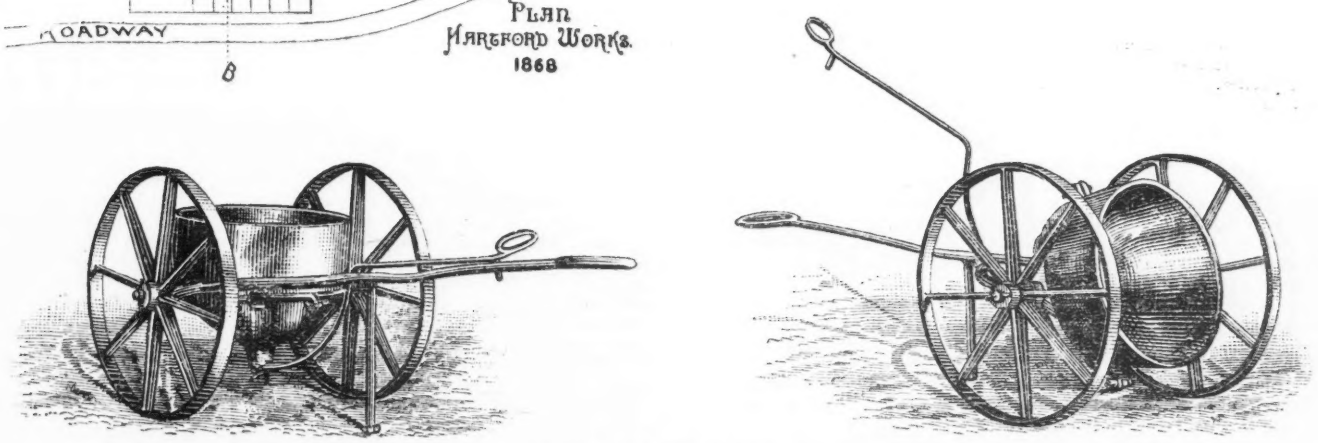
The many experiments with varying pressures of blast, fuels, tuyeres, etc., are too old to need repetition; but one of the practical parts of the process with the big furnace was the self-dumping slag-buggy devised by General Adams, illustrated here, which stood the test of heaviest service. The wheels are quite high (from 26 inches to 28 inches), of cast-iron hub and rim, wrought spokes and tire. The axles should be cast on the pot and chilled. When placed in position, the pot should be able to revolve freely from the lug on the bottom. The handle is Y-shape, with eyes on the ends, which spring over the axles inside the wheels.

One can readily see that a touch of the rod from the bottom will dump the load, the center of gravity being above the axles—the pivotal point—if the rod is unlocked. The hight of wheels makes it very easy to handle a load of 300 pounds, and to dump it without approaching the hot metal.



PLAN HARTFORD WORKS. 1868





ADAMS'S SLAG-POT.

Fluorescence of Bismuth.—Sulphate of bismuth, according to M. de Boisbaudran, does not fluoresce in a vacuum when submitted to the action of the electric discharge; but when mixed with sulphate of calcium, it gives out a fine reddish-orange fluorescence. Sulphate of bismuth, with sulphate of strontium, gives a bright orange fluorescence; and with carbonate of strontium, a blue light. With sulphate of magnesia, sulphate of bismuth gives an orange fluorescence. M. de Boisbaudran has applied this method to the discovery of traces of bismuth in a number of chemical products and reagents of the laboratory, several of which were reported to be pure.

ON BLAST-FURNACE SLAG AND SLAG CEMENT, AS COMPARED WITH PORTLAND CEMENT.*

By Dr. C. Schumann.

The investigations detailed in this paper were undertaken with the view of ascertaining what amount of importance may be attached to blast-furnace slag or slag cement as an ingredient of mortar, especially as compared with Portland cement. Hard, vitreous slag is almost devoid of hydraulicity, even when finely pulverized, and the same may be said of the powder that results from the spontaneous disaggregation of certain kinds of slag. Where, however, the slag is granulated, that is, chilled in water, it hardens under water when mixed with lime. Such granulated slag has recently been ground with lime and other ingredients, and sold under the name of "pozzolana cement," although the term "slag cement" would be more correct. In order to test the accuracy of statements that had been made respecting such cement, a quantity was obtained and subjected to examination. In making the comparative tests with Portland cement, care was taken to use both materials of the same degree of fineness; the mortars were also of the same consistency, and were rammed into the molds by a mechanical rammer, so as to secure uniformity. No expansion was found to take place with slag cement mortars; but cracks due to contraction were noticed in the test cakes.

In testing the porosity of slag cement mortars, the cement was mixed with three times its weight of standard sand, and molded into cakes 0·59 inch (1·5 centimeters) thick. These were allowed to harden for seven days, either under water or in moist air, and were then subjected to a water pressure of 16·4 feet (5 meters) for a week, the surface exposed to the water pressure being 3·87 square inches (25 square centimeters). When allowed to harden under water, the slag cement mortar allowed 0·0976 cubic inch (1·60 cubic centimeters) of water to pass, while the Portland cement mortar remained water-tight. The slag cement cakes that hardened in moist air allowed 0·366 cubic inch (6·05 cubic centimeters) of water to pass, while the Portland cement cakes showed a filtration of 0·11 cubic inch (1·8 cubic centimeters).

The slag cement sets very slowly—in from twelve to twenty hours—and after the initial set has taken place, the increase in strength is much slower than with Portland cement. In seven days, the strength of a mortar composed of three parts standard sand and one part slag cement was 93·87 pounds per square inch (6·6 kilograms per square centimeter), as compared with 248·22 pounds per square inch (17·1 kilograms per square centimeter) attained by Portland cement mortar of similar composition. The crushing strength of the 1 to 3 mortar was 1524·73 pounds per square inch (107·2 kilograms per square centimeter) for the slag cement, and 2056·02 pounds per square inch (200·8 kilograms per square centimeter) for Portland cement; both after remaining twenty-eight days under water. When exposed to the air for fourteen days, after having been immersed for a similar period, the difference between the two cements was still more marked. The tensile strength of the Portland cement was 516·30 pounds per square inch (36·3 kilograms per square centimeter), as against 182·06 pounds per square inch (12·8 kilograms per square centimeter) for the slag cement. When a larger proportion of water was used in making the briquettes, the difference became still more marked. While Portland cement increased its strength 64 per cent under these conditions, as compared with an immersion period of twenty-eight days, slag cement lost 18 per cent of the strength that it would have attained if kept under water for the whole of the twenty-eight days. This is regarded as a point of great importance in building operations.

[Notwithstanding the faint praise that Dr. Schumann vouchsafes to blast-furnace slag, it has been very favorably reported on by good authorities, and the production of this article is increasing with enormous rapidity. The German iron-masters were not slow to take advantage of this invention, by which they can utilize at least a part of these slags, which at present cost them so much to take care of, with no return, and it will not be long before a slag cement works will be considered as a necessary adjunct to the ordinary blast-furnace plant. We already learn of one concern, which after running a small trial works for about a year, has now under construction a plant capable of turning out 40,000 tons of slag cement every year.—Editor Engineering and Mining Journal.

SULPHUR IN COAL.

Written for the Engineering and Mining Journal by J. P. Elsom.

In nearly all the published analyses of bituminous coals, the proportion of sulphur is purposely withheld. This is really a needless precaution; for nearly all who consume coal know that sulphur is almost invariably present. It generally exists as a sulphuret of iron, and inasmuch as its presence depreciates the actual unit value—consumes heat-units in its own combustion—it would be better if there were a comparative standard of excellence in this respect, and all coals were classed better or worse as they contained less or more of sulphur. This presupposes selling coal by chemical test. Why not? this being the only means of determining real values save by actual consumption; and when the coal is burned, not many care to arbitrate rebates.

The estimation of sulphur alone is by no means difficult. Take, for instance, coal finely pulverized, 1 part; niter, 8 parts; sodic chloride, 16 parts; potassium carbonate, 4 parts. Place the mixture in a platinum crucible, and heat gently. At a certain temperature, the whole ignites and burns gently. Increase the heat until the mass is fused; when the test is complete, the mass is white. When cold, dissolve in water, acidulating the solution by means of hydrochloric acid and barium chloride, adding the latter as long as white precipitate forms. This precipitate is the sulphate of baryta, and, collected on a filter, washed, dried, ignited, and the filter burned away, and the remaining sulphate of baryta weighed, every one hundred and sixteen of this residuum indicates sixteen of sulphur. On this basis, it is by no means a difficult or expensive matter to occasionally make the test for sulphur in any variety of coal.

* From the *Deutsche Bauzeitung*, through Proceedings of the Institution of Civil Engineers.

NOTES ON CANADIAN FLUOR-APATITE OR FLUOR-PHOSPHATE OF LIME.

Written for the Engineering and Mining Journal, by F. J. Falding, M.E.

(*Concluded from page* 384.)

Nature of the Apatite-Bearing Rocks.—The above-described belt or belts of apatite-bearing rocks consist of pyroxenite interstratified with rust-colored granitic gneisses, and form, probably, the most recent series of the Laurentian system. It is immediately overlain by the Trenton limestone and Potsdam sandstone; some of the lowest strata of the sandstone in places contain grains and specks of apatite, doubtless derived from disintegration of the apatite-bearing rocks. It is also worthy of notice that the principal fossils in these superimposed Lower Silurian rocks consist of the lingulæ, which, unlike nearly all other shells, have the constitution of bones, or are mainly phosphate of lime. (Sterry Hunt, *American Journal of Science*, 2, xvii., 237, phosphate of lime, 85·79; carbonate of lime, 11·75; magnesia, 2·80.) Logan describes the species of orthoceras in the Potsdam of Canada, along with great numbers of lingulæ antiquæ, which places the cephalopods lower than they were known before to occur. (Dana, *Geology*, page 187.)

According to Bell (Engineering and Mining Journal, Vol. XXXIX., page 316, May 9th, 1885), the apatite-bearing rocks constitute one of the higher members of the Laurentian system. They are arranged in great belts, differing more or less from each other, and individually traceable for long distances, in which they maintain their distinctive characters. The limestone bands that they contain constitute the great distinguishing feature in which these strata differ from the rest of the Laurentian rocks. Besides the limestones, the Laurentian rocks of the apatite regions have associated with them bands of schists, slates, pyroxenite, quartzite, etc., and they also contain felsite, hornblende, mica, serpentine, graphite, pyrite, pyrrhotite, and ores of iron, copper, lead, and other minerals. The pyroxenite appears to take the form of irregular beds and almost isolated masses, running with the stratification, and the apatite in mass invariably occurs with the pyroxenite.

The occurrence in adjacent and parallel rocks of graphite and magnetite is noteworthy. The same association is found in conjunction with the Norwegian apatites. The connection is even more intimate, the graphite and iron being intimately mixed, as at the Hull iron mines, and the apatite and magnetite occurring together not only in the Canadian apatite region, but in the iron mines at Port Henry, New York, and Dover and Hurdstown, New Jersey. The impurities commonly occurring with apatite are, in addition to the pyroxenite, which may be called the gangue-rock, calcite, quartzite, mica (biotite and phlogopite), iron sulphurets, with occasional zinc-blende and galena, zircon, sphene, etc. The fluoride of calcium, invariably a constituent of apatite, as pointed out by Professor Bell, approximates the proportion contained in the bones of mammals. The mica and feldspar also contain from twelve to seventeen per cent of potash, another approximation to an organic constitution.

Probable Origin of the Phosphates.—It seems to be generally agreed that the apatite-bearing rocks form the most recent of the Laurentian series. Dana (pages 134, 138, 140, 143) states that many of the so-called Azoic rocks are formed out of the ruins of the older Azoic rocks, and that the absence of fossils is in all probability owing to their so highly metamorphosed condition, that "these later crystallized deposits, which are here called Azoic, can hardly be identified as such."

Any theory accounting for the presence of apatite in these Azoic rocks is hardly complete unless it also accounts for the limestones, graphite, etc., and, in the absence of proof to the contrary, the probability of formation is strongly in favor of a similar deposition to that of more recent formations of a similar character, the method of deposition of which is known with approximate accuracy. I think the burden of proof in this case decidedly rests with those who claim that these deposits of phosphate of lime have not the remotest connection with animal life. All the known sources of phosphate of lime, from the guanos, through the bone-beds of Carolina, coprolites, Spanish apatites, apatitic corals, and down to the lingulæ of the immediately superimposed Lower Silurian, are of organic origin, and I submit that the Canadian apatite, with its bedded, banded structure and its associated fluorine, potash, and pyrites, carries nothing in its condition other than could be expected of a highly altered and metamorphosed bed of organic origin. Its associated graphite certainly suggests vegetable growth of no inconsiderable amount.

Dana says (page 145): "The mind that has any adequate apprehension of the remoteness of the Azoic era will not question the probability of such changes, and is ready to wonder that the evidences of subsequent alterations are not more extensive and obvious. The term Azoic, as here used, implies absence of life, but not necessarily of the lowest grades. The reasons in favor of life of some kind are:

"1. The formation of limestone strata in the Azoic age, like those of the Silurian, in connection with the fact that Silurian, and later limestones, are known to be mainly made from organic relics. Moreover, remains of what are believed to be rhizopods, and named Eozoön, have been detected in the Azoic rock at Ottawa, Canada. Limestone beds have been formed out of the microscopic shells of rhizopods, for chalk is largely due to their growth and accumulation. . . . It is also possible that vegetable life may make strata of limestone. There are coral-secreting plants as well as animals. . . .

"2. The occurrence of graphite—graphite being known to be a common result of the exposure of mineral coal or charcoal to high heat, and, in certain rocks of Rhode Island and Massachusetts, having undoubtedly been made from vegetable remains.

"3. The occurrence of anthracite in small pieces in the iron-bearing rocks of the Arendal, Norway, apatite region, which rocks are probably Azoic (so-called) in age.

"Against this organic origin, it may be urged that the limestones and graphite have been of chemical origin, and the occurrence of such chemical formations in the earlier age of the globe is not improbable. Yet the argument still leaves it an open question." Page 208: "The seas of the Trenton period were densely packed with life," etc., these rocks being of an age immediately succeeding the Azoic, and "most recent Laurentian." Page 209: "The small bivalve crustaceans, leperditæ,

occur in immense numbers, as on the Ottawa, in Canada, where a bed of limestone two feet thick is wholly made up of them, and yet the length of the shell is only one ninth of an inch. It is probable that the beds of the Trenton limestone followed the western border of the Azoic toward the Arctic." Page 600: "It is probable that the oceanic waters were also in an impure state, from containing an excess of salts of lime, and this also involved the existing of inferior species, such as crinoids, corals, and mollusks, a very large proportion of whose weight is in calcareous material. The removal of this excess of lime from the waters produced limestone strata, purified the waters, and fitted the oceans for other species. The great prevalence in the Primordial of lingulæ (whose shells contain a large amount of phosphate of lime) is further evidence of the greater diversity of the waters, and seems to indicate the presence of an excess of phosphates." (*Vide* also pages 601, 609, 611, 708, 709, 715.)

The juxtaposition, at the point of separation between the oldest Paleozoic and the latest Azoic, of the lingulæ and the apatite, so similar in constitution, is at least suggestive.

I do not think that the organic origin of apatite is rendered impossible, either from any absence of life or of the necessary kind of life during the period of its formation.

The lingulæ differ from almost all other shells in that their principal constituent is phosphate of lime instead of carbonate. The type exists to-day. It has been the most persistent through all the ages of the world; and judging from the number of its fossils existing down to the very edges of the Azoic, it must have existed in enormous quantities. Any one who appreciates the mass of the more recent rocks built up by shell-fish of the carbonaceous type will have no difficulty in imagining a bed of lingulæ sufficient in extent to account for our apatites.

Nor does the chemical or mechanical condition of the mineral itself tend to disprove an organic origin, but rather the contrary. The presence of fluorine and potash, which, of course, may be accidental, requires explanation, especially when taken in connection with the constitution of the organic life immediately succeeding.

Three examples of the phosphatic nodules of the Lower Silurian are given by Dr. T. Sterry Hunt (Logan's Report, Canada, 1851–52, 1863, and *American Journal of Science*, II. xviii., 235, 1854) as follows:

Phosphate of calcium	36·38	44·70	40·34
Calcium carbonate and fluoride	5·00	6·60	5·14
Carbonate of magnesia	...	4·76	9·70
Sesquioxide of iron and Alumina	7·02	8·60	12·62
Insoluble	49·90	27.90	25·44
Volatile	1·70	5·00	2·13

A constitution so much like that of apatite, together with its associated pyroxenite, as to be very suggestive.

In following the formation of the great phosphate deposits of the world from the guanos to the apatites, the loose recent deposits of phosphatic excrements or remains; the hardened and stratified substrata; the corals or limestones, phosphatized by infiltration from these remains; the semi-metamorphosed deposits of Spain; the hydro-apatites (Dana, *Mineralogy*, page 534), containing P 40, Ca 47·31, Fe 3·36, C 3·60, H 5·30), and which, heated in a tube, decrepitate and give out ammoniacal water; the phosphorite, which affords traces of bromine and iodine; we find that all contain constantly diminishing evidences of organic origin, and that they are apparently governed by the following laws:

1. A rapid and localized secretion.
2. The loss of the volatile and soluble constituents according to age and climate.
3. An induration of the deposit, with a tendency of phosphatic elements to combine with adjacent limestone.
4. Concentration of the phosphates out of surrounding matter and apatitic metamorphosis.

Suppose such an original bed of phosphates precipitated from the highly charged ocean waters, either through the intervention of the lingulæ (analogous to the chalk, etc., depositions of to-day), or of marine plants, or simply deposited by precipitation; no one would expect to find such a bed clearly and sharply defined like the deposits of Carolina or the mussel-beds of Prince Edward Island, etc. Yet the evidences of original bedding are not wanting.

Sterry Hunt distinctly claims that the most important deposits are bedded. Bell claims that the "pyroxenite from which the apatite is clearly derived" is bedded, and states that, although the apatite deposits are veins, "they are of an irregular and unusual nature."

The changes to which these rocks have evidently been subjected account for the rest: the irregular nature of the bedding; the apparently inextricable breaking together of the contents of the deposits, often apparently a confused mass of country-rock and pyroxenite cemented by apatite; the crystallization and recrystallization of the apatite, filling up the breaches thus made, and even penetrating fissures cutting the country-rock, and crystallizing in thin layers with its attendant calcite on planes of gneiss rock; the later filling by mere *detritus* of apatite, now hardened to the consistency of the original apatite, as evidenced by the "sugar" phosphates, which usually constitute the filling of the distinctly vein formations, as at the Little Rapids mine.

Analogous disturbances of bedded deposits and corresponding vein formations are to be seen in connection with some coal and magnetite beds. Compare the description of magnetite beds in South Mountain as follows:

"The magnetic ore-beds of the South Mountain are regularly interstratified with the gneiss bed, and are evidently original sediments, . . often suddenly pinched out by the pressure to which the Azoic formation has been subjected. . . . The whole of this effect is not produced by pressure. Much of it is due to the shape of the original deposit. That is seen by observing how the ore at the edges of the ore-body gradually changes into rock, and this change is so imperceptible that one can hardly say where the ore ceases and the rock begins. Practical miners and others still hold the old erroneous opinion that magnetic ore-beds have issued like lava from the interior of the earth, and urge two principal arguments for this opinion: 1. That the ore-body looks as if it filled a fissure with irregular walls; 2. That trap dikes accompany the ore in many of the mines." *

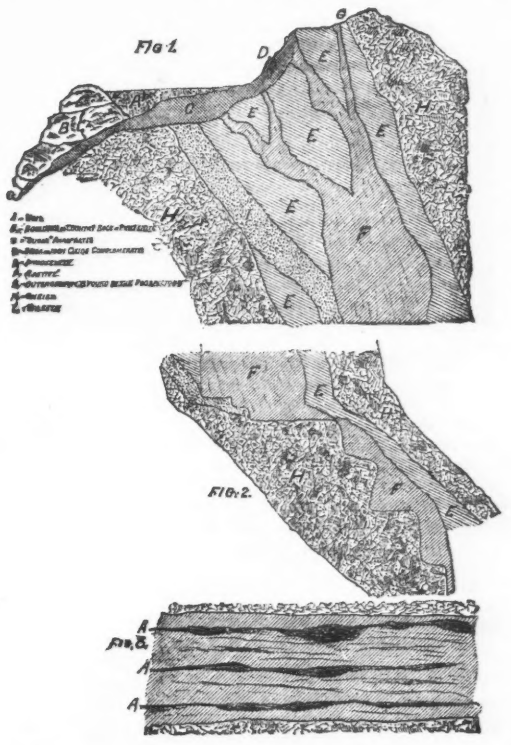
* *Second Geological Survey of Pennsylvania*, D 3, Vol. II., Part I., Geology of South Mountain Belt of Berks County; D'Invilliers.

That this description applies to many of the apatite mines almost verbally it is not necessary to say.

I submit, therefore:

1. That the apatite and pyroxenite and calcite were deposited in bed form
2. That, by an apparent law, the phosphate of lime separated and concentrated, filling up fissures and breaks, the result of violent motion of the strata.
3. That, although much contorted and disturbed, the formation of the principal deposits where the mineral may be said to be in place, is still bedded.

If, therefore, it be considered that these deposits form part of an



immense bed two hundred miles long and cropping up over a tract of at least twenty-five miles in width, this bed, consisting of banded gneisses, limestones, pyroxenites, and apatites, crushed, contorted, broken up into synclinals and anticlinals, crystalline in all its constituents, I think it is easy to understand its practical occurrence, its varying thickness, its sudden cutting off, and yet its general persistency when followed, the absence of any form except that of general stratification on the large scale. So far as the practical consideration as to the probable continuity in depth is concerned, this question of ultimate origin is of great importance. If the deposits are the remains of original beds, they are likely to be subject to the same laws that govern such deposits elsewhere; in short, subject to demineralization and to faulting. The extreme action to which they have been subject will naturally make the occurrence of the mineral more varied and even precarious than in beds of similar but less altered formation. Experience has shown that, while subject to all these vicissitudes, well-defined surface croppings continue to produce an average quantity of mineral.

Mode of Occurrence of Apatite.—Where apatite is now worked, it has invariably been found as a surface outcrop, and has been followed from the surface. The prospector invariably looks first for the pyroxenite, having found which, he searches in the crevices of the rock for apatite. The so-called cap-rock is then removed. This cap generally consists of masses or boulders of pyroxenite or the country gneisses, generally more or less cemented (*B*). Sometimes the covering consists simply of soil.

The appearance shown in Fig. 1 is very common in the district; and that shown in Fig. 2 is not an unusual result of a continuation of the work.

The "sugar," or granular apatite, like partly indurated sea sand, but generally containing larger water-worn nodules, is remarkable, as it often forms the fillings of deposits of apatite that are unmistakably vein fissures (*see* Boyd Dawkins's description of the Little Rapids mine; also, some of the openings on the North Star mine). When dry, these deposits are as hard as some soft sandstones, but in presence of moisture they rapidly disintegrate. The flattened surface deposits are generally composed of this granular apatite, and give rise to the opinion, so often expressed, that the apatite occurs as "pockets" on the surface of the rock only.

Often some of the branches leading to the mass of apatite will consist mainly of crystalline limestone containing immense numbers of crystals of apatite and mica (biotite and phlogopite). The outcrop often consists of a conglomerate of mica, as at *D*, the softer apatite having been worn down to *E* (Blackburn and McLaren mines). Sometimes the outcrop consists of a gossan of oxidized pyrites (Emerald mine), where there is also an immense bed of the granular apatite mixed with iron oxides and soil. The iron pyrites and mica seem to be interchangeable.

Apatite rarely occurs without either the one or the other, but both rarely occur together in quantity in the same deposits. At the Gemmill mine, the place of both appears to be taken by magnetite, and numerous exfoliations and stains of manganese are present. Sometimes the pyrites occurs in nests of crystals, sometimes it is freely disseminated through the ore, and often it occurs as extremely fine sheets and scales between the planes of cleavage of the apatite, which are often so distinct that a

crystal may be separated with the same ease as one of mica, only in thicker sheets.

The deposits are often traversed by dikes, varying from a few inches to several feet in thickness, of dolerite, of a later date than the deposits, which they generally dislocate. In the neighborhood of these dikes, granular phosphate is generally found.

As a result of practical experience (and of course excepting such workings as have evidently been on veins) where sufficient capital and perseverance have been forthcoming, a steady output has been attained. The quantity of apatite within one hundred feet of the surface has been too great to cause deep mining to be undertaken, more especially as the extreme alterations to which the deposits have been subjected have inclined cautious miners to "follow the stuff." In the one or two instances, however, in which deep work has been attempted, no diminution in the average amount of ore has resulted: the quality has, of course, somewhat improved. About the same average quantity has been yielded. Whether still deeper work will show larger quantity, I think doubtful, excepting where work has been commenced on a mere offshoot or stringer of the main body.

The apatite-bearing belt is sometimes several hundred feet in width. It then often carries apparently several apatite bodies interstratified (High Rock, Fig. 3).

I do not think that the enormous quantity of apatite occurring in Canada is appreciated. Where mining is carried on with capital and system, the workings merely amount to surface quarrying. Three mines on the river du Lièvre produce each annually about 5000 tons. The territory actually worked by each company is but a few acres, and yet it is all won from surface workings, averaging perhaps from 50 to 60 feet in depth. Although these mines include many thousand feet on the run of the lode, nearly all of which is known from surface indications to contain apatite, comparatively few feet are actually worked. The location of the openings has been made by chance. In one instance, a "show" was opened merely because a cow-path led to it three years ago, when the ground was a pathless wilderness, and the main workings are still on this "show," after many thousand tons have been extracted.

Even to-day the only limit to production is the market. If the market would absorb 500,000 tons, instead of 25,000 a year, I can see no reason why the supply should not equal the demand.

THE NEW YORK METALLURGICAL WORKS.

One of the most complete and useful metallurgical institutions in this country is Mr. E. N. Riotte's New York Metallurgical Works. For those who wish to test ores or processes, every facility is there afforded; and every kind of machinery for crushing, concentrating, roasting, amalgamating, chlorinating ores, and for testing any other method of extraction of gold and silver or other metals, can be found there, as the following list of appliances in these works indicates:

- Dodge crusher.
- Gates crusher.
- Foster-Firmin crusher.
- Cornish rolls.
- One-stamp Kendal battery, wet or dry, with silver-plated copper plate and Frue vanner attachment.
- Two-stamp battery, wet or dry, with silver-plated copper plate and Frue vanner attachment.
- Large and small Lucop & Cook pulverizer, wet and dry.
- Experimental jigs.
- Rapid ore concentrator.
- Eighteen-inch combination pan, with steam bottom complete.
- Four-foot combination pan, with steam bottom complete.
- Golden Gate concentrator.
- Walker-Carter roasting-furnace.
- Settler, with quicksilver well and self-discharge.
- Freiberg barrel amalgamator.
- One Brückner furnace, fire-place both ends, and steam connection.
- Ten different sizes assaying, cupelling, ore and bullion smelting furnaces.
- Complete gold chlorinating apparatus, all sizes up to ½ ton scale.
- Complete silver leaching apparatus, all sizes up to ½ ton scale.
- Complete metallurgical and chemical laboratory, with eight scales, from an Oertling No. 12 to a Fairbank platform.
- Stone ore-sampling floors and ore storage-room, dynamos, accumulators, all electro-metallurgical paraphernalia complete.

So many difficulties are found in the actual treatment on a working scale of most new ores—difficulties that do not show themselves in mere laboratory tests, and that are so expensive to overcome in large and new works—that the opportunity of testing ores on a small and inexpensive working scale, with facilities for using all the latest and most approved machines and processes, is one that engineers should eagerly avail themselves of, and that can be the means of securing immense economy to mining companies by the intelligent selection of plant and methods of extraction adapted to their ores and surroundings.

One of the advantages offered by Mr. Riotte's works is, that engineers can do their own experimenting free from intrusion or interference. This is a matter of no small importance, and to it is added the advantage of having, when desired, the advice of so able, experienced, and skillful a metallurgist and chemist as Mr. Riotte.

Carbonate of Manganese in North Wales.—Recently a large deposit of carbonate of manganese has been discovered near Harlech, in North Wales. This is the only known occurrence of this mineral in Great Britain. The owners of the Mastyn iron-works are the proprietors, and considerable quantities of the ore have been sent to Mastyn for the manufacture of spiegeleisen.

A New Electrical Experiment.—We learn from *l'Electricien* that M. H. Dunville pledges his scientific reputation to the accuracy of the following observation: If two glasses of water be placed, one upon the north pole of a powerful magnet and the other upon the south pole, in four or five minutes the former acquires a slight alkaline reaction, while that on the south pole becomes slightly acid.

Alloy of Aluminium and Tin.—A useful alloy of aluminium and tin has been obtained by M. Bourbouze, by melting together 100 parts of the former metal with 10 parts of the latter. This alloy is whiter than aluminium, and has a density of 2·85, a little greater than that of the pure metal, so that it is not too heavy to replace aluminium in instruments requiring great lightness of their parts. It is less affected by reagents, etc., than is aluminium, and also is more easily worked. Another of its merits is, that it can be soldered as easily as brass without any special preparation.

Measuring the Deflection of Bridges.—A novel method of measuring the deflection of railroad bridges has been tried in Russia. An iron pipe 1¼ inches in diameter was carried along the outside of one girder. From this pipe, on each abutment at the pier, and at five intermediate points at each span, vertical pipes of the same diameter branched out. Inside, and near the top of each vertical pipe, was fixed a graduated ¾-inch glass tube, the iron pipe being cut away on both sides. The zero divisions on the tubes were all the same distances above the flange of the girder. Before the bridge was loaded, the apparatus was filled with water, the tops of the upright pipes covered over, and the water was then drawn off until it stood at zero in each gauge. On the bridge being loaded, the deflection could be read with ease.

The Panama Canal.—The "facts" that appear from time to time respecting the Panama Canal continue to be very contradictory. M. Beyeler, a Swiss engineer, formerly engaged on the Panama Canal, has recently published some more "Truth about the Panama Canal." He gives the excavation work, as now estimated, of each of the twelve sections of the canal, and the quantities excavated in each. The total of the estimate is 131 millions, and that of work done 16 millions of cubic meters. But to the gross amount have to be added 20 million cubic meters for auxiliary works and construction of dams, and an estimated outlay of $20,000,000 for the great weir at Gamboa. He says that since the spring of the present year hardly any work has been executed along the line. M. Charles de Lesseps stated, in March last: "I am quite sure that for the whole of 1886 the average per month will be over a million cubic meters, and that at first there were only 100 million cubic meters to excavate." M. Beyeler states the expenditure to date "for excavations, amounting to 16,000,000 cubic meters, at 542,516,440 francs, the cost required for completion at 1,625,000,000 francs, and the interest and burden on shares and obligations, assuming the progress of the work to be at the rate of 7,000,000 cubic meters per annum, or 1,230,000,000 francs, giving a total of nearly $680,000,000.

The Settle Safety Mining-Lamp.—Mr. Miles Settle, managing director of the Madeley Coal and Iron Company, North Staffordshire, and managing partner of the Darcy Lever Coal Company, Bolton, Lancashire, has just patented a new lamp of his own invention, which is in successful operation in the Leycett Collieries, near Newcastle-under-Lyme. It is an electric lamp, very simple in construction. The small incandescent lamp is fixed in an air-tight glass of tumbler shape. This is placed in a larger glass, also of tumbler shape. These glasses are filled with water, which causes the small globe containing the light to float and connect the current, and at once supplies the light required. This float is worked by a very simple contrivance, so that, if the glass or lamp should get broken, the light is extinguished instantaneously, and a connection is impossible until the authorized person attends to it. Further, if the water or charge should evaporate so as not to raise the inner glass, the light goes out, and the disconnection also takes place. Mr. Settle claims for his invention absolute safety under all conditions, full light in any position, freedom from danger if the lamp should be accidentally broken, freedom from the effects of the velocity of the air, simplicity, and cheapness. The lamp has been submitted to very crucial tests. It has had a powerful gas-jet played upon it for twenty-four hours without igniting the gas. It has also been put in a gas-chamber charged with gas, and weights have been placed on it so as to break it into fragments, without exploding the surrounding gas. It will throw out light even with the entire lamp completely submerged.

A New Optical Glass.—Professor Abbé, of Jena, announces the discovery of new kinds of glass, specially adapted for the manufacture of lenses. Professor Abbé realized, as far back as 1880, that the secondary chromatic aberration, and what he terms the chromatic difference of the spherical aberration (being a slight residual spherical aberration for all rays not of mean refractive index), are defects inherent in the glass that opticians have at their disposal, and he then resolved to attempt the discovery of a glass free from these defects. He soon set to work, together with Dr. Schott, who conducted the chemical work and the melting of the substances examined. A special laboratory for these investigations was set up at Jena, and the researches were supported by several liberal endowments from the Prussian government. Valuable results of these researches have from time to time been given to the world, and it is now stated that, by the use of a new glass, a lens, to be called the "apochromatic objective," which gives great superiority in the finer qualities of definition, has been produced. Professor Abbé claims for this lens that the more perfect corrections permit equal magnifying to be obtained by using a longer focus objective with an eye-piece of higher power than hitherto has been usual, thus obviating some of the difficulties of very short focus objectives. Moreover, the foci for visible and for photographic purposes are identical. Special compensating eye-pieces have also been devised for use with the new achromatic objectives. We hope soon to be able to give fuller particulars regarding this discovery, and we are glad to be able to say that the new optical glass will be offered to the world without any restriction whatever.

PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent-Office.

GRANTED NOVEMBER 23D, 1886.

352,931. Kiln for the Manufacture of Charcoal. H. M. Pierce, Nashville, Tenn.
352,947. Fagoting Metal. Frank B. Felt, Pullman, Ill.
352,987. Machine for Manufacturing Boiler-Tubes. William Arnold, Barnsley, County of York, England.
353,009. Cinder-Car for Blast-Furnaces. Peter L. Weimer, Lebanon, Pa.
353,011. Coke-Breaker. Benjamin I. Allen, Newark, New Jersey.
353,094. Process of Annealing Metals. Joseph A. Tatro, Beaver Falls, Pa.
353,116. Machine for Rolling Rods of Metal. John Beavis, Cleveland, Ohio.
353,155. Traction-Engine. John Q. A. Newsom, Seymour, Ind.
353,186. Thermostat. George Westinghouse, Jr., and Frank Moore, Pittsburg, Pa.
353,205. Sand-Reel for Artesian Wells. Charles G. Coss, Lima, Ohio.
353,211. Piston-Packing. John W. Dudley, Portland, Oregon.
353,222. Apparatus for Making Sulphuric Acid. John Hughes, Stapleton, New York.
353,247. Process of Making Steel. David Brose, Pittsburg, Pa., Assignor of three fourths to George W. Miller, John J. McGuire, and George Bromley, all of the same place.

PERSONALS.

Mr. F. G. Corning, mining engineer, has returned to the city, from a two months' professional trip to Colorado, Arizona, and California.

Mr. Richard Holland, Superintendent of the Enterprise Coal Company, was run over by a freight train at Mount Carmel, Pa., last week, and instantly killed.

Mr. E. N. Riotte, of the New York Metallurgical Works, is at present at Bozeman, Montana, on professional business. His telegraphic address is, as usual, his works in this city.

Mr. H. M. Howe, the distinguished metallurgist, formerly with the Orford Copper Company, began his ectures on the metallurgy of copper at the Massachusetts Institute of Technology on the 3d inst.

It is stated that Baron Sadoine, the ex-managing director of the Cockerill Company, will soon leave for China, in connection with the intended erection in that country of large arsenals and ship-building yards.

Mr. Ernest Gaujot, mining engineer, of Belleville, Ontario, and who has had much experience in the apatite region of Canada, is in the city, and can be addressed care of this office.

Prof. Robert H. Richards, President of the American Institute of Mining Engineers, has been very ill, since the St. Louis meeting in October, with typhoid fever, which he had contracted by exposure previous to that time, and which began to develop itself during the last days of the meeting. Fortunately, he was able to reach home before becoming entirely helpless. We learn with much relief and pleasure that Professor Richards is now considered out of danger, and in the way of sure, though slow, recovery Knowing the treacherous nature of the disease, we can not feel entirely free from anxiety; but there is every reason for gratitude and hope. The numerous friends of Professor Richards will share with us these feelings.

FURNACE, MILL, AND FACTORY.

A charter has been granted to the Bristol Rolling-Mill, Bristol, Bucks County, Pa. The capital stock is $80,000.

The Shenandoah Manufacturing Company, Milnes, Page County, Va., is repairing its furnace preparatory to starting it up.

Peckham's National Tubular Axle-Works, at McKeesport, Pa., were destroyed by fire on the 28th ult. The mill had just been completed.

The firm of Henry R. Worthington, Brooklyn, New York, will erect a brass foundry in connection with its steam-pump works.

The Bessemer Steel-Works of Carnegie, Phipps & Co., at Homestead, Pa., will shut down soon for about six weeks, over the holidays, in order to make repairs.

The Chattanooga Paint Company, Chattanooga, Tenn., has begun the erection of a large mill to manufacture mineral paint from oxide of iron. It will have a daily capacity of about 15 tons.

The Detroit Pipe Company's works, Detroit, Mich., were burned early on the morning of the 3d inst., together with thousands of dollars' worth of machinery and patterns.

It is stated that the Centralia Iron and Steel-Works, Centralia, Ill., have appointed a committee to go East for the purpose of contracting for a plant with which to make their own steel at Centralia. The committee consists of Judge E. A. Condit, President S. M. Warner, and Superintendent M. H. Monkhouse.

The Cincinnati Corrugating Company, Ohio, is doing an extensive business in corrugated iron-work. Iron roofing and siding is now extensively used to protect from fire originating on the outside, and corrugated or crimped iron ceilings and interior linings to protect inside wood-work.

The carbon manufacturers of the United States held a meeting at Cleveland, Ohio, on the 26th ult. Every company in the United States but two was represented. The meeting was devoted to an interchange of views on the state of trade and prices and to the organization of a national association or pool of the manufacturers.

CRUISERS.—The Navy Department has awarded the contract for the construction of the proposed new naval cruiser No. 2 (Charleston), Union Iron-Works of San Francisco, at $1,017,500; cruiser No. 3 (Baltimore), Cramp & Sons, of Philadelphia, $1,325,000; gunboat No. 2, the Columbia Iron-Works and Dry Dock Company, of Baltimore, $247,000.

The property of the Everett Iron Company will be sold at public auction, at Everett, Bedford County, Pa., on the 15th of December. The decrees direct that the property shall first be offered as a whole and then in parcels, the most advantageous bids to be adopted, provided that they reach $215,000, the minimum fixed by the courts.

The road locomotives built by Messrs. Aveling & Porter for the Merrimac Mill Company, of Merrimac, Cal., are doing excellent work. During the whole summer, they have been used for hauling heavy loads of lumber and other materials, and the cost of doing it has been much less than one half the expense of the same work by animals. The engines are proving themselves very economical motors, and their good deeds are causing large inquiries for other places.

The Pennsylvania Iron Company, with a capital of $150,000, has been organized by Martin Maloney, W. L. Elkins, Jr., C. K. Robinson, of Philadelphia, and B. W. Grist and Edwin A. Moore, of Reading, Pa. The object is to manufacture machinery of all kinds, especially that used for the Hanlon & Leadley process for making gas, which for over a year has been manufactured at the shops of B. W. Grist & Co., of Reading. The works will be in West Philadelphia.

Messrs. Meech & Co., of Cleveland, Ohio, by the application of intense steam heat under pressure, claim to dissolve the sulphur and break up the chemical combinations contained in refractory ores; and with their improved machinery, claim to extract from 85 to 95 per cent of gold and silver from milling ores, either free or refractory. They have a plant of machinery now in operation at their works in Cleveland, and are prepared to work ore for those who contemplate buying machines.

The Hudson River Ore and Iron Company, of Burden, New York, which recently leased the Cold Spring furnace from the West Point Furnace Company, as mentioned October 23d, intends to experiment with its roasted carbonate ore, of which it has a large deposit at Burden, with the intention of running the furnace on as large a proportion of it as is possible. If it is found that satisfactory iron can be made by using its spathic ore alone in the blast-furnace, the company contemplates the erection of two modern furnaces at Burden station, on the line of the Hudson River Railroad and Hudson River. It has 6000 tons of coal on hand, received by boats, besides coke, ore, and limestone, and expects to get in blast about the middle of December.

BIDS ON CONTRACTS.

STEEL LIGHT-SHIPS.—The Treasury Department has received the following bids for two first-class light-ships (steel): Houston & Woodbridge, Linwood, Pa., $48,000 and $49,000; James Bigler, Newburg, N. Y., $74,750 and $74,750; John H. Dialogue, Camden, N. J., $57,200 and $57,400; H. A. Ramsey & Son, Baltimore, Md., $56,900 and $56,700; Columbia Iron-Works, Baltimore, Md., $57,470 and $57,470; Pusey & Jones Company, Wilmington, Del., $54,700 and $54,860.

DREDGING.—Lieut.-Col. Walter McFarland, U. S. Engineers, New York City, has received the following bids for dredging 40,000 cubic yards of material, Gowanus Bay, N. Y.: Morris & Cummings Dredging Company, New York City, 32½c. per cubic yard, total, $13,000; Elijah Brainard, New York City, 32c., $12,800; P. Sanford Ross, Jersey City, N. J., 35c., $14,000; Henry Du Bois & Sons, New York City, 33c., $13,200; W. H. Beard, Brooklyn, 34½c., $13,800. For dredging 170,000 cubic yards of material, Buttermilk Channel, N. Y.: W. H. Beard, Brooklyn, 38c. per cubic yard, total, $64,600; Henry Du Bois & Sons, New York, 29½c., $50,150; P. Sanford Ross, Jersey City, N. J., 32c., $54,400; Elijah Brainard, New York City, 38c., $64,600; Morris & Cummings Dredging Company, New York City, 33c., $56,100; United States Dredging and Canal Construction Company, 23½c., $39,666.66.

RIP-RAP STONE AND DREDGING.—Lieut.-Col. Peter C. C. Hains, U. S. Engineers, Washington, D. C., has received the following bids for rip-rap stone: H. P. Gilbert, Washington, D. C., at first locality $1.03, at second 95c.; G. Vanderwerken, Washington, $1.03, 93c.; 20,000 cubic yards at first and 12,000 cubic yards at second, approximately. For dredging in the Washington Channel, American Dredging Company, Philadelphia, 19·9c.; National Dredging Company, Wilmington, Del., 20·9c.; Morris & Cummings Dredging Company, New York, 22c.; Benson & McNee, San Francisco, 16½c.; Rittenhouse Moore, Mobile, Ala., 13c. About 400,000 cubic yards, approximately.

REMOVING ROCK.—Major Jared A. Smith, U. S. Engineers, Portland, Me., has received the following bids for removing rock in Portsmouth Harbor, N. H.: Thomas Symonds, Leominster, Mass., $19.25 per cubic yard; George W. Townsend, Boston, $18.97 (acceptance recommended); Edward R. Lowe, New York, N. Y., $28.75; Isaac A. Sylvester and Thomas A. Rowe, Boston, Mass., $27.87; Solon S. Andrews Biddeford, Me., $26.

WATER-PIPE.—The Water-Works Trustees, Oberlin, Ohio, have received the following bids for furnishing water-pipe: The Columbus Sewer-Pipe Company, Columbus, O.; the American Sewer-Pipe Company, Columbus, O.; the American Sewer-Pipe Company, Akron, O.; Carter & Hatch, Oberlin, O.; and Francey's Sons, Toronto, O. All bid the same figures (except Francey's Sons), namely, 21c. for 10-inch pipe, 14c. for 8-inch pipe vitrified; T's, 21c. for 10-inch and 14c. for 8-inch. Francey's Sons bid on 8-inch 15c., and on T's 84c. and 56c.

LABOR AND WAGES.

The McCullough Iron Company's rolling-mills at North East, Maryland, which have been shut down since August 7th, reopened on the 29th ult. The advance for which the men struck has been granted, and all will be reinstated.

A joint convention of miners belonging to the Knights of Labor and the members of the Miners' Association will be held at Scottdale, Pa., on the 4th inst., to decide upon united action in the event of a strike in the Connellsville coke region. The operators state emphatically that they will make no further concessions, and that, therefore, a conference is useless.

All the miners in the Seventh District, Coalton, Ohio, came out on the 1st inst., on a refusal by the operators to grant an increase of five cents a ton for mining. A long struggle is expected. A similar demand was made by the miners in the Wellston District.

The voting returns as to whether or not the Amalgamated Iron and Steel Workers shall, as a body, join the Knights of Labor, are coming into the headquarters at Pittsburg, Pa., rapidly, and indicate, it is said, a preponderating majority against a connection with the Knights of Labor. A large number of influential lodges have voted almost to a man against any such move. While the great body of the members seems to be opposed to merging the Amalgamated Association in the Knights of Labor, the movement to organize in both unions is still going on. While these men do not wish to abandon the independent union they wish also to have the advantages derived from being in the Knights of Labor.

The Miners' Association Convention at Scottdale, Pa., last week decided to insist upon the demands made upon the coke operators some time ago; but in order to give the latter ample opportunity to consider the demands, the time for striking was extended to December 25th. In the mean time, in compliance with an invitation from the Miners' Association, the Knights of Labor will meet them in joint convention, to decide upon some united action in the event of a strike.

COAL TRADE NOTES.

ENGLAND.

Thirty men were instantly killed by an explosion in the Lomore Colliery in Durham on the 2d inst.

MARYLAND.

Mr. Robert Anderson has leased eleven hundred acres of coal land about six miles west of Oakland, on the Baltimore & Ohio Railroad, and is now developing it and shipping ore.

The case of Albert Holle *vs.* the Consolidation Coal Company of Alleghany County, is on trial in the Circuit Court for Washington County. It is claimed by Mr. Holle that his property, situated in the city of Frostburg, has been damaged and partly destroyed by

reason of its undermining by the Consolidation Coal Company in the operation of its coal mines.

NEBRASKA.

A vein of bituminous coal was struck last week at a depth of 511 feet near the Union Pacific bridge at Omaha, by persons who were boring for natural gas.

OHIO.

It is reported that the Columbus & Hocking Valley Coal and Iron Company and the Ohio & Western Coal and Iron Company are about to form a syndicate to buy up all the coal lands of Ohio. It is said that options have already been taken on coal lands in the Hocking and Tuscarawa valleys, in Coshocton, Meigs, Mahoning, Columbiana, Jackson, and several other counties. The syndicate proposes to secure uniformity in the price of coal and labor. It is asserted by coal operators that during the past two years they have made no money, on account of labor difficulties and the cheapness of coal.

PENNSYLVANIA.

ANTHRACITE.

The first coal was shipped from the Silver Brook colliery, near Mahanoy City, last week.

The comparative statement of the business of the Philadelphia & Reading Railroad and Coal and Iron Companies for October, 1886, as compared with the same month in 1885, shows an increase in gross earnings of $30,763 ; an increase in expenses of $109,626 ; a decrease in net earnings of $78,863. The statement for the eleven months ended October 31st, 1886, as compared with the same period in 1885, shows an increase in gross earnings of $1,113,064 ; an increase in expenses of $2,053,099 ; a decrease in net earnings of $940,035.

The coroner's investigation as to the causes leading to the explosion referred to in our last issue in the Conyngham shaft, Wilkes-Barre, operated by the Delaware & Hudson Canal Company, tend to show that the company was to blame for the accident. O'Brien, on his death-bed, denied that there were any danger signals, and this statement is confirmed by the testimony of several other miners. Several of the injured men have died.

BITUMINOUS.

The fire in the Standard mine, at Mount Pleasant, has been extinguished, and a small quantity of coal was run out of the slope and a few ovens charged on the 29th ult The output will be gradually increased daily, but the mine can not run to its full capacity until the shaft is repaired and restored to working order, and the part of the mine where the fire occurred cleared of the wreckage and dirt that have accumulated there.

COKE.

George H. Anderson & Co. are making preparations for the development of the coal vein on their property at Bolivar, Westmoreland County, and the erection, in the spring, of 100 coke-ovens. The tract from which the fire-clay now used in brick-making is taken embraces several hundred acres underlain by a vein of coking coal. The coal has turned out 76 per cent of coke, which showed, when analyzed, 91 per cent fixed carbon and 6 per cent ash. The vein is opened now at one point from which coal for use at the brick-works is taken. Another opening is making from which the entries will be driven.

TENNESSEE.

It is stated that the Nashville & Florence Railroad, the Louisville & Nashville branch, which now extends to St. Joe, in Lawrence County, will be constructed through to Sheffield, contracts to that effect having been signed. This will connect Sheffield and Nashville by direct railroad communication. In addition to this, it will pass through the rich ore-beds of the Shoal Creek Iron Company in Lawrence County, Tenn., and the coal-fields of the surrounding counties.

A joint meeting of the Alabama & Tennessee Coal and Railroad Company, the Sheffield Land, Coal, and Iron Company, and the Alabama Improvement Company, was held at Nashville last week. Among those present were Gen. Willard Warner, of Tecumseh, Ala. : Gen. J. W. Burke, Mobile, Ala. ; Capt. J. W. Dimmick, Montgomery, Ala. ; Henry B. Tompkins, Sheffield, Ala. ; Col. J. C. Neely, Memphis ; Col. E. W. Cole, Nashville ; Col. R. H. Richards, Atlanta, Ga. ; W. B. Wood, of Florence, Ala., and others. The object was to discuss a contract previously made between the different companies interested. Several months ago, the Alabama & Tennessee Coal and Railroad Company made an agreement with the Sheffield Land, Coal, and Iron Company, by which the former was to erect three blast-furnaces in the city of Sheffield, in consideration for which it was to receive $200,000 of the bonds of said company ; the stockholders of the Alabama Improvement Company, who hold $6100 in shares of the other company, were also in attendance yesterday, and in joint session the contract was ratified by a unanimous vote, and the directors were authorized and instructed to execute a final contract in accordance therewith. At a subsequent meeting of the directors, Messrs. E. W. Cole, J. C. Neely, and Willard Warner were appointed a committee to execute the said contract with the Sheffield Company at the meeting held in Sheffield on December 1st.

GAS AND OIL NOTES.

Exports of refined, crude, and naphtha from the following ports, from January 1st to November 27th :

	1886. Gallons.	1885. Gallons.
From Boston	5,266,642	8,026,681
Philadelphia	138,361,181	139,245,870
Baltimore	14,208,859	10,520,087
Perth Amboy	5,648,102	
New York	358,045,652	337,262,316
Total exports	521,530,436	495,054,954

MARYLAND.

A syndicate of Western Pennsylvania capitalists has been prospecting in the mountains west of Clearspring, Washington County, and is said to have discovered oil and gas in quantity. Nearly 16,000 acres of mountain land have been leased by it. On this land, building-stone of good quality has been found ; also, iron ore, cement, and slate. Operations are to begin on an extensive scale in the early spring. Quarries will be opened and oil wells sunk. The plan now is to carry the natural gas from the mountains by way of iron pipes laid along the Chesapeake & Ohio Canal to Washington, and by the same means to Baltimore and all the neighboring cities and towns. If the proposed railroad between Bedford, Pa., and Williamsport, Md., is built, the value of these discoveries will be greatly enhanced. The area of the land already leased extends from Clearspring to Hancock, a distance of about fifteen miles. Leases upon large tracts, near Cumberland City, have also been obtained, but the prospects there are not nearly as promising as in Washington County.

MICHIGAN.

A number of Pittsburg capitalists have formed a company to operate near Port Huron. The company has already leased a few thousand acres of land west of Port Huron and has two wells drilling. One of them struck a vein of gas at a depth of about 1000 feet, which blew off at a pressure of over 150 pounds, but this was not considered satisfactory, and the hole will be put down about 1000 feet more.

PENNSYLVANIA.

The Independent Natural Gas Company, which will apply for a charter to operate in several of the townships in Allegheny County, along the Ohio River, has leased several thousand acres of land in Aleppo, Kilbuck, Ohio, and Ross townships, and has started a well on one of its farms.

The Pennsylvania Gas Company's Boise well, at Canonsburg, came in on the 28th ult., and has been turned into the line. Tests show a pressure of between 450 and 500 pounds a minute.

The People's Gas Company has begun work on a new eight-inch line from Murrysville to Wilkinsburg, where the lines will be connected with the four mains running into the city.

GENERAL MINING NEWS.

The total shipments of ore from Ashland, Wis., during the season of 1886, up to and including the week ended November 24th, were as follows :

GOGEBIC DISTRICT.

Ashland	65,251	Pabst	17,687
Aurora	86,369	Puritan	15,559
Iron Chief	9,032	Trimble	10,780
Bessemer	4,788	Valley	1,842
Brotherton	8,881	Sunday Lake	10,962
Colby	248,810	Superior	2,697
Germania	19,734	East Norrie	8,944
Iron King	24,320	Iron Chief No. 2	552
Ironton	16 075	Nimikon	4,105
Kakagon	15,503		
Montreal	15,316	Total ore from Ashland	709,405
Norrie	110,715		
Odanah	11,483		

ALABAMA.

A slate company is organizing at Clear Creek, to have a capital of $100,000, to work a property near the line of the Louisville & Nashville Railroad, which contains slate of fine quality in large quantity.

JEFFERSON COUNTY.

RED MOUNTAIN MINING AND MANUFACTURING COMPANY.—This company has been organized with a capital stock of $300,000, to mine coal and iron and to manufacture coke, iron, and steel. Its ore lands lie on Red Mountain, south of Birmingham. The incorporators are Messrs. John T. Milner, W. T. Milner, and G. H. McLaughlin.

LAUDERDALE COUNTY.

FLORENCE LAND, MINING, AND MANUFACTURING COMPANY.—This company has been organized at Nashville, with a capital stock of $3,000,000, and has bought 4000 acres of land immediately adjoining Florence, Ala., and 2900 acres of iron lands adjacent. W. B. Wood was elected President ; A. W. Wils, Vice-President ; H. C. Woods, Secretary ; and W. P. Campbell, Treasurer. Two iron furnaces will be at once erected. Florence has good railroad and river transportation.

WALKER COUNTY.

ELLEMAC COAL COMPANY.—This company has been incorporated by Messrs. L. B. McFarland, J. T. Farguson, S. H. Brooks, A. C. Tredwell, T. J. Latham, L. B. Musgrove, F. M. Nelson, and H. M. Neilly, all of Memphis, to mine coal and iron and other ores and minerals, and erect rolling-mills, blast-furnaces, and coke-ovens, etc. The incorporators own land in Walker County, about thirty miles west of Birmingham, which contains coal. The Sheffield & Birmingham Railroad and the Memphis, Brunswick & Atlantic Railroad run through the lands. It is intended to have the Mobile & West Alabama Railroad completed to Birmingham within eighteen months.

ARIZONA.

PIMA COUNTY.

ATLAS MINING COMPANY.—Arrangements are making for the erection of a thirty-ton smelter at the Caledonia group of mines, near Red Rock. This group of mines was developed before this company was organized at Chicago to work them.

YAVAPAI COUNTY.

ARIZONA CONSOLIDATED MILL AND MINING COMPANY.—The property will be sold at public auction. It consists of the mill-site and its appurtenances and other estate, fee and leasehold, situate at Bueno, and the location known as the Morning Glory mine. This sale is on behalf of the bondholders, who have not received interest on their bonds for some time.

CALIFORNIA.

MONO COUNTY—BODIE DISTRICT.

Reports for the week ended the 20th ult. :

BODIE.—Twenty-five tons of ore are crushed weekly.

BULWER.—There were shipped to the mill 416 tons of ore ; average pulp assay, $19.35. Shipped on the 16th instant, $9120.08.

STANDARD.—There were shipped to the mill 370 tons of ore. The usual progress has been made in the work at the mines.

SIERRA COUNTY.

IDAHO.—A fire broke out in an old shaft at the 400-foot level in this mine, Grass Valley ; damages about $3000.

YOUNG AMERICA.—Owing to the scarcity of water, work has stopped and will not be resumed until the supply increases.

COLORADO.

CLEAR CREEK COUNTY.

CENTENNIAL.—The bottom of the shaft shows a vein of nearly solid ore three feet in thickness. The mine is within the corporate limits of Georgetown.

NORMAN.—A contract has been awarded to sink the shaft upon this lode to a farther depth of fifty feet. The shaft is now 100 feet deep, the bottom showing a vein of solid ore four inches in thickness. The contractors are W. R. Scott and Thomas Farley & Co. J. P. Johnson & Co. are also sinking from the surface on a vein of solid galena four inches in thickness. This is one of those that after being allowed to remain in a dormant state for a number of years, are now taken up and developed by those who see their true value. This claim is supposed to be the eastern extension of the celebrated Mendota lode.

PURITAN GOLD AND SILVER MINING COMPANY.—This property, on Democrat Mountain, is opening by

two drifts running ahead on the vein. The upper drift has reached a distance of eighty-two feet, the entire distance showing more or less mineral, ranging from two to four inches in width. The lower drift has reached a distance of seventy-five feet, and is fast nearing a point under a pocket of ore known to exist just ahead. When this drift has reached a distance of 100 feet, it is the purpose to cross-cut south, to cut two other veins, which, where opened, show very promising. The breast of this lower drift shows a fine streak of mineralized quartz. An assay from an average lot the ore taken from the upper workings returned 140 ounces silver to the ton.

DOLORES COUNTY.

GRAND VIEW.—This company has begun operations on the Phœnix lode, and is preparing to do a large amount of work on that property this winter.

LAKE COUNTY.

From the Leadville *Herald-Democrat*, we condense the following:

It is stated that the Omaha & Grant Smelting and Refining Company will establish new and extensive works at Leadville. The company has secured fifteen acres additional territory adjoining its former smelter site in California Gulch, on which, rumor has it, the new establishment is to be erected.

ADAMS.—At the annual meeting, the following directors were elected: John J. Adams, William H. Gelshenen, Sheppard Knapp, and Arthur D. Williams, of New York; J. J. Sylvester, of St. Louis; Charles Donnelly, of Denver; and T. B. Ryan, of Leadville. Mr. Samuel Adams was reappointed manager at an increased salary.

CLEVELAND.—A company has been organized at St. Louis, with a capital of $2,000,000, shares $10 each, to work the Cleveland mine on Little Ella Hill, adjoining the Ideal Mining Company's property. The price paid was $31,000 in cash and 70,000 shares of stock. The subscription price of the stock was 30 cents. The mine has scarcely been opened so far, and has shipped about $10,000 worth of ore from development-work. The ore, in addition to carrying a fair amount of silver and lead, also contains from eight to twenty-five dollars a ton in gold.

COLONEL SELLERS.—The shipments of crude ore last month amounted to about 800 tons. In addition to this, about 1600 tons of concentrates will be sent to the smelter. The mine during the past four months has been placed in splendid condition. At the present time, an effort is making to reopen the caved ground, in which the four miners were killed last spring, but operations are slow and costly.

JOE DAVIS.—This mine, situated on East Fryer Hill, adjoining the Tip Top mine, is reported to have struck good ore at a depth of 370 feet. Assays made show from 30 to 150 ounces in silver to the ton, and from 20 to 60 per cent in lead. The ore is comparatively free of zinc and iron pyrites, being a fine-looking galena, with oxide of iron.

LEADVILLE CONSOLIDATED.—During the last ten months, the company made a net profit of $75,000. Since the payment of the last dividend in October, $19,500 have been transmitted to the treasurer.

MAID OF ERIN.—Development-work in this lode from the Henriett mine is progressing with gratifying results. Up to the present time, no ore is broken except such mineral as is encountered in advancing development-work. The mine will, however, soon be in a condition to make a large daily production.

SILVER CORD.—The last month ranged between 800 and 900 tons. From 500 to 600 tons of this amount will consist of first-grade mineral, and the remainder will be iron ore. The lessees on the property are doing very well, and extracting considerable high-grade ore. The remainder of the product consists of iron of fair grade. The work of driving the lower levels to intercept the American ore-chute, opened in the Imes lode, is advancing at fair speed. About fifty feet more are required to intercept the trend of this chute.

SMALL HOPES.—The company is driving line drifts between its property and the boundaries of the Lee Basin and Compromise properties, both of which are discovering high-grade ore.

PITKIN COUNTY.

In the United States Court at Denver, on the 26th ult., Judge Hallett granted a petition of the Durant people for five additional witnesses in the apex side-line case that is to be tried in those courts this week. These witnesses are to be used in rebuttal testimony, and, as Senator Teller has said, are to testify upon single points of facts. Some time ago, Judge Hallett issued Rule 23 of the court, which prohibits more than twenty witnesses being presented on either side in any controversy. The Durant owners petitioned for five additional witnesses on the ground that they could not properly present their case. The side-line claimants will probably put an equal number of witnesses on the stand.

DAKOTA.

LAWRENCE COUNTY.

CALEDONIA.—The company continues to push its workings with 105 men on the pay-roll. The superintendent further states in his official weekly report, dated November 22d, that the ore produced on the 300-foot level was 447 tons, and from other sources 1064 tons, making a total of 1511 tons. The shaft advanced 9 feet, making a total of 73 feet; 563 ounces of bullion were shipped to New York, or about $9289.50 output for the first half of November.

PENNINGTON COUNTY.

AMERICAN TIN MINING COMPANY.—The shaft has attained to a depth of 140 feet. Day and night shifts are employed. The ore now taken out is considered the best ever found.

IRON HILL.—The final clean-up has been made in the mill, and it has closed for the present. The mill has run continuously for about twelve months, having first dropped its stamps on November 29th, 1885.

HARNEY PEAK.—The company has purchased property in the Central Hills, among which is the Ada group. The company had a bond on these locations for some months.

MICHIGAN.

COPPER MINES.

HURON.—Late advices from the mine indicate quite a marked change for the better. The lode in the fourteenth level going south of No. 8 shaft is showing paying ground. The productive ground at this point is very much longer than was ever shown in the levels above, and also richer. Work has begun on the sinking of this shaft below the fourteenth level, which is opening up good stoping ground. The lode in No. 6 shaft continues rich in all grades of mineral.

IRON MINES.

The following statement, given by the Marquette *Mining Journal*, shows the amount of iron ore shipped from the ports of the districts given below, for the season of 1886, up to and including Wednesday, November 24th:

	Tons.
Marquette—Marquette District	841,802
St. Ignace— " "	72,294
Escanaba— " "	654,865
Menominee District	860,710
Grand total of lake shipments	2,429,671

Shipments of Pig-Iron.

Pioneer furnace, Marquette	5,815
Deer Lake furnace	2,105
Vulcan furnace	15,541
Pioneer furnace, Escanaba	9,780
	33,241

The gain over the shipments from the above ports, during the same period in 1885, is 362,906 gross tons.

BUFFALO.—This mine, on the new range east of Negaunee, has been sold to a syndicate composed of Minneapolis and Milwaukee parties, it is said, for $200,000. This property was the first one opened on the new range, and it is estimated will ship 70,000 tons of ore next season.

MINNESOTA.

ST. LOUIS COUNTY.

MINNESOTA IRON COMPANY.—During the season of 1886, including the week ended November 24th, there were shipped from Two Harbors 304,396 tons of ore from this company's mines.

MONTANA.

The mining men of Helena, Butte, and vicinity have united in a petition to the United States Treasury Department for the erection of an addition to the present assay-office in Helena, of a refinery for the purpose of separating gold and silver and reducing the product to the shape of mint bars. Besides affording an opportunity for all producers of bullion in Montana, Idaho, and Washington to get the full Eastern value of their bullion (less transportation charges) in a very little time after its production, such an institution would be a material step toward the establishment of a mint at Helena.

LEWIS & CLARKE COUNTY.

Mr. F. M. Chadbourne, of the Empire Company, has secured a bond on the Blue Bird and Hickey mines, near the Gloster, in the interest of English capitalists. The amount of the bond is $55,000 and the duration until the first of January.

EMPIRE.—The air-compressor and drills have started up. The compressor will be principally used at present for driving forward work in the tunnel, which has cut the Whippoorwill vein, and is to be driven straight ahead until the Empire lode is reached. The additional five stamps of the mill have started up, and are now crushing ore constantly.

SILVER BOW COUNTY.

GOLD HILL.—The Gold Hill case, says the Butte *Miner*, bids fair to become as famous as the Smoke-house case. At the late term of court, suit was begun against fifty-seven surface claimants on the Gold Hill claim (north of the court-house at Butte), to recover possession of the ground claimed, and a large number of cases occupied by them. Of the fifty-seven defendants, all but six defaulted at the trial, and the appearance of these six was of no avail, as a judgment was entered in favor of the plaintiffs, W. A. Clark, C. P. H. Beilenberg, and H. S. Clark. There are many handsome buildings on the ground, and, as we understand it, these become the property of the plaintiffs. Executions have just been issued and are serving.

NEVADA.

EAST BEST & BELCHER SILVER MINING COMPANY.—The corporation is formed to mine in the State of Nevada. The directors are H. G. Sieberst, C. W. Beach, B. F. Dahl, C. H. Mason, and J. J. Hawkins. The capital stock is placed at $10,000,000, divided into 100,000 shares.

ELKO COUNTY.

From official reports dated November 26th:

BELLE ISLE.—An east cross-cut sent in on the 150 level is penetrating favorable ground.

NAVAJO.—Good assays are obtained from the vein on the 350 level. A vein six inches wide was cut on the 150 level.

NEVADA QUEEN.—Ore was cut in the east cross-cut No. 1, 49 feet from the shaft. The ore in the south drift No. 2 from the shaft is 3½ feet in width.

NORTH BELLE ISLE.—The vein in the north drift has widened beyond the breadth of the face. The vein formation in the north drift on the 150 level has widened, and the ore is less concentrated than at other points.

TORNADO CONSOLIDATED.—A vein carrying bunches of quartz showing gold was cut in extending the adit tunnel.

HUMBOLDT COUNTY.

PARADISE VALLEY.—The mill at Spring City has started up on ore from the Paradise Valley mines, after a temporary shut-down for repairs.

LYON COUNTY.

COMO-EUREKA.—The Welter mill at Palmyra has been leased by this company. The ore on the dump will be hauled to the mill.

STOREY COUNTY—COMSTOCK LODE.

We condense the following from the Virginia City *Chronicle:*

Following is a summary of the ore and bullion product of the mines in Storey County for the quarter ended September 30th, 1886, condensed from the assessor's abstract statement:

ORE YIELD, VALUE PER TON, AND TOTAL COST.

	Tons.	Value per ton.	Gross val.
Con. Cal. & Virginia	22,489	$12.37	$278,204
Belcher	4,647	10.55	481,112
Crown Point	5,420	8.87	48,086
Savage	2,002	21.93	43,962
Yellow Jacket	13,718	10.90	149,529
Kentuck	2,827	14.85	45,000
Total	51,104	...	$418,365

The above statement shows that 51,104 tons of ore represent the total output for the quarter, producing bullion valued at $418,365, a decrease of 25,559 tons of ore below the product of the preceding quarter, and a falling off of $379,828 in the bullion output during the same period. There is evidently an error in the abstract statement, or else the returns have not been correctly reported.

The following mines, in addition to those mentioned in our last issue, will resume operations. They have been shut down since 1882: Bullion, North Gould & Curry, Scorpion, Wells-Fargo, Keystone, Caledonia, Confidence, New York, Prospect, Julia, Europa, and others that have been abandoned, with the exception of keeping up the annual holding work, since 1880.

ANDES.—Work has been resumed after a shut-down of many months. The levels down to the 700 will be

immediately reopened, and the large deposit of low-grade ore, extending from the surface to below the 700, will be thoroughly explored. Through the concentration process, a large portion of the low-grade quartz on the upper levels of the mine can be profitably treated.

BULLION.—The Crœsus shaft in this mine has been reopened down to the 100 level. Material is on the ground for the construction of substantial hoisting-works. The superintendent expects to have every thing in readiness to open up the shaft down to the 600 level in less than six weeks.

CHOLLAR.—A joint Potosi south drift is advancing from the tunnel line on the 250 level. The shaft has been reopened down to the 200 level, from which a south drift will be sent out to cut the downward extension of the ore development in Potosi.

CONSOLIDATED CALIFORNIA & VIRGINIA.—There is a continued improvement in the grade of ore extracted from the mine, and proportionate increase in the bullion output. It is now definitely ascertained that the development, so far as explored, has a depth of 450 feet, extending downward from the 1200 to the 1650 level, and the prospects are more than flattering that the advance of the south drift from the Ophir shaft on the 1065 level will demonstrate that it extends upward to and above that level. The official statement of the weekly product of the mine also shows a marked improvement in the grade of ore extracted. During the week ended the 20th ult., 1094 tons of ore were shipped to the Morgan mill, and 1711 tons to the Eureka mill. The average value of all the ore milled during the week, according to the assays from the battery samples, was $44.22 a ton. Bullion valued at $100,889.32 was shipped to San Francisco.

GOULD & CURRY.—The 425 level is reopening through the south drift, which will be extended to the point above the 500 where ore was cut in advancing the south drift from the uprise above the 600.

HALE & NORCROSS.—A south drift sent out from the 1300 level is penetrating vein-matter.

JUSTICE.—It is alleged that the ore extracted in prospecting will defray operating expenses.

NORTH GOULD & CURRY.—This mine, which has been closed for a long time, is situated west of the C. & C. shaft. The shaft is down 300 feet below the surface. The trustees have decided to resume developments.

OVERMAN.—The extraction of ore from the tunnel level will be resumed when facilities for crushing are obtainable. Work is in progress preparatory to reopening the upper levels through the old shaft.

POTOSI.—The south drift along the vein is showing high-grade ore.

SAVAGE.—The south drift on the 500 level is said to have cut the upward extension of the ore development uncovered on the 600 during the week ended the 13th ult. Assays from samples show it to be lower in grade than on the level below. On the 600 level, the face of the south drift is now out 85 feet north of the Savage shaft, with which connection will be made the first week in December. The south drift on the 800 is skirting the hanging wall of a vein in its advance to connect with the shaft.

SIERRA NEVADA.—The face of east cross-cut No. 5 on the 520 level is showing low-grade ore.

TENNESSEE.

WAYNE COUNTY.

The Tennessee Valley Iron and Coal Railroad Company was organized at Memphis on the 19th inst., with J. C. Neely, President; J. B. Killebrew, Vice-President; and John Overton, Jr., Secretary and Treasurer. The company represents a capital of $1,200,000, and owns 71,700 acres of iron land in Wayne County, which is located in the western iron belt, midway between Ætna Furnace and Schofield, and covers an area of 120 square miles. It is claimed that analysis of the ore shows it to contain 54 per cent metallic iron, requiring less than two tons to make one ton of pig-iron. There was a furnace in operation on the land from 1836 to 1873. It is the nearest body of ore to Sheffield, Ala., where it is contemplated to erect five large furnaces of 150-ton capacity each. Among Nashville men who are stockholders are: J. B. Killebrew, Samuel Cowan, M. A. Spurr, W. J. Whithorne, R. F. Jackson, Richard Douglas, A. W. Wills, and J. M. Phillips.

UTAH.

SALT LAKE COUNTY.

NEW EMMA.—The mine is still improving, and the miners are cutting a new station at the bottom of the shaft for the large pump.

WASHINGTON COUNTY.

CHRISTY.—The Salt Lake *Tribune* says: The recent developments in the deep workings of the California mine, Silver Reef, Utah, have demonstrated Mr. R. P. Rothwell's theory, namely, that the White and Buckeye reefs are distinct layers of ground, and never have been in contact. The deep workings of the California have settled the interesting problem in accordance with Mr. Rothwell's theory. He also alluded to the sand-rock formation and ore-bodies as presenting every evidence of permanence, every utterance of which has been verified by exploration made in this mine.

VIRGINIA.

Gen. James A. Walker has sold his large mineral property to Bullet & Co., the recent purchasers of the Foster Falls property, in Pulaski County, the sale of which was mentioned in the JOURNAL of November 20th. He also sold the mineral property known as Cave Hill, in the same vicinity, to a Northern syndicate.

STAFFORD COUNTY.

RAPPAHANNOCK.—Good reports are received from this mine, at which the working force has been increased. The superintendent's report shows that the mill is running on from eight to ten dollar ore. The edge is seven feet wide.

MARKETS.

NEW YORK, Friday Evening, Dec. 3.

Silver.

DATE.	London. Pence.	N. Y. Cents.	DATE.	London. Pence.	N. Y. Cents.
Nov. 27..	46½	101	Dec. 1	46	99½
29..	46¼	100	2	45	97½
30..	46	99½	3	45¼	98

Silver has declined rapidly during the week, and is still weak, though it is hoped the decline has been arrested to-day, the price having recovered slightly in London.

SUPPLEMENT TO THE NEW YORK METAL EXCHANGE MARKET REPORT.

Movement of Bonded Metals, Port of New York, November, 1886.

METALS.	Imports, Nov., 1886.	Exports, Oct., 1886.	Stocks, Dec. 1, 1886.
Iron ore	3,488 tons	.....	.....
Pig-iron	8,411 "	191 tons	2,173 tons
Spiegel-iron	5,039 "	.....	902 "
Old rails	2,890 "	.....	2,580 "
Scrap-iron	814 "	.....	2,438 "
Scrap-steel	2,687 "	.....	695 "
Steel blooms and billets	9,491 "	.....	.....
New steel rails	.....	.....	135 "
New iron rails	.....	3 "	12 "
Wire and nail rods	5,941 "	.....	8,752 "
Iron bars, etc	1,023 "	28 "	
Iron beams	90 "	.....	.....
Sheet iron	517 "	52 "	1,788 "
Steel sheets	.....	.....	.....
Cotton ties	.....	.....	554 "
Steel tires and forgings	438 "	.....	62 "
Steel tubes	23 "	.....	.....
Steel bars, etc	881 "	1 ton	126 "
Tin plates	141,960 bxs.	.....	59,846 bxs.
Taggers' iron	2,107 "	.....	.....
Pig-tin	1,005 tons	.....	.....
Copper ore	.....	2,523	.....
Copper matte	116 "	tons	.....
Ingot copper	220 lbs.	1,982,867 lbs.	.....
Copper (old)	3,328 "	.....	66,800 lbs.
Brass (old)	878 "	.....	11,561 "
Pig-lead	222 tons	.....	2,598 tons
Lead (old)	.....	.....	468 lbs.
Spelter	168 "	1,195 lbs.	67 tons
Sheet-zinc	6 "	.....	11 "
Scrap-zinc	9,323 lbs.	.....	13,400 lbs.
Reg. antimony	140 cks.	.....	111 cks.
Nickel	13,460 lbs.	.....	3,912 lbs.
Type metal	30 tons	.....	.....

Copper.—This market continues very quiet; indeed, its tone has fallen off a little for two weeks past, and the anxiety to carry light stocks over the settling up at the end of the year has made the market appear weak, although it is not at all probable that Lake could be purchased from producers below 12 cents.

The Anaconda is used abroad to depress prices, Chili Bars being quoted, by cable to the Metal Exchange to-day, as closing at £39 7s. 6d. Best Selected, £45. Here, prices are unchanged at 12c. for Lake, and Orford and Baltimore, 10¾@11c.

The Anaconda being the disturbing factor in the market, we have sought to secure special and reliable information, and our correspondent wires us this morning as follows:

"Anaconda running nine furnaces protected by thirty deputy sheriffs. Only a few days' coal supply on hand. The chances of success in securing a reduction of wages are extremely doubtful."

The company has, we believe, 26 matting-furnaces.

The fact mentioned by our correspondent, that the furnaces are being run under the protection of the sheriff, shows that the company has not conceded the advance of 15 per cent in wages, and though our dispatch does not state it, we believe the mine is not being worked, the miners having thus far refused to make a reduction in wages.

The reduction in wages at the smelter would make but an unimportant reduction in the price of copper.

It need not cause surprise should the smelter again stop. There can be no profit in running it under the "protection of thirty sheriffs," and with the London market at £39 7s. 6d. for Chili Bars.

The imports of copper at this port during the month of November were 116 tons matte, and exports of matte and ore 2523 tons, and of ingot 1,982,567 pounds.

The total imports of copper for ten months of this year, for the whole United States, were: Ores, 22,490 tons, as against 30,579 tons in the corresponding months of last year; ingots, bars, etc., 14,966,207 pounds; sheets, 42,022 pounds; as against 32,900,869 pounds of bars, etc., and 66,321 pounds of sheets in the corresponding period last year.

The total value of our copper exports in ten months this year was $3,879,211, as against $7,062,169 last year in corresponding months.

Tin.—This market was very quiet early in the week, and but little was done at the Metal Exchange; but yesterday, the business took a jump, and 230 tons changed hands at 22·40c. for spot, and 22½c. for January. To-day, sales were made at 22·60c. The week's business amounted to about 300 tons.

London cables to-day, spot Straits at £101 5s., and three months £102, and sales of 80 tons.

STOCKS OF TIN.	Nov. 1, 1886. Tons.	Dec. 1, 1886. Tons.
Foreign tin in London	3,752	4,523
Second hands in Holland	1,336	1,870
Spot stock in America, estimated	1,200	1,150
Total spot stock	6,288	7,543
Afloat for London	3,240	1,970
Holland	1,200	800
America	980	*1,250
Total afloat	5,420	4,020
Total visible supply	11,708	11,563

* Includes 190 tons at dock.

Lead.—Lead has been very dull during the week, with only light jobbing sales at 4·40c.; and bids at 4·40c., and even at 4·35c., were asked for in vain. There is no demand for the metal at that price, and as no bearing influence is even claimed to have been exerted during the week, we may look upon 4·35@4·40c. at least as high as natural causes will put the market at present. This is a dull month, and but little business can be expected until the books are made up for the year. The imports of lead at this port in November were 222 tons, and stocks 1st of December, in bond, were 2598 tons.

Messrs. John Wahl & Co., of St. Louis, telegraph as follows to-day:

Market quiet and uneventful; the nominal value for both Common and Refined is 4⅛c., with retail sales only.

Messrs. Everett & Post, of Chicago, telegraph as follows to-day:

Market quiet and dull, prices unchanged, demand only moderate, and but very little doing to test actual figures. Offerings are very light; sales will scarcely foot up 300 tons at 4·17½c. and 4·15c.; closing quotations, 4·15@4·17½c. Fire at Kansas City Smelting-Works reported confined to smelters—refining furnaces uninjured.

Spelter.—There is no change in this market. We quote 4·30@4·40c. for Western brands, and 7c. for New Jersey. Silesian is quoted 4·50@4·70c. nominal. Silesian Spelter in London is quoted at £14 10s., which is an advance of 2s. 6d. The imports of Spelter in November were 168 tons, and stocks 67 tons, and 13,400 pounds of Scrap-Zinc.

New Jersey Zinc Oxide, 4@4½c., according to grade.

Antimony.—We quote Cookson's at 9@9⅛c. Hallett's has remained at from 7⅛@7¼c. Hallett's is quoted in London to-day by cable to the Metal Exchange at £29 10s.

Nickel.—We quote 60c. There were 13,400 pounds of nickel imported during November, and stocks on bond here were 3912 pounds on December 1st.

Bismuth—Is quoted at $2@$2.25 a pound.

Aluminium—Is quoted at 90c.@$1 an ounce.

Quicksilver.—The market rules here at 52½c. a pound, and in London at £7 5s.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Dec. 3.

American Pig.—The market continues very strong, and though nominally unchanged, is in a condition where higher prices are actually realized. Foundry irons are scarce for prompt delivery, and though some contracts have been made covering deliveries into next year, yet prices are not established for next year's deliveries. The Thomas Iron Company will make prices next week, and the probability is, that the price will be $19.50 or $20 for No. 1, a price that has already been paid for this brand in second hands.

There is a perfect rush all through the South and West to build blast-furnaces, and there is a prospect of a great surplus of iron in about two or three years. In the mean time, while the period of investment of capital lasts, every thing will be lovely, and the reaction will not be believed in or considered for some time yet. It is none the less true that we are preparing, with the vast number of new furnaces of the most approved type situated in the most advantageous districts, for a lower ebb in prices than any we have ever yet seen. Like the *memento mori* of the jolly monks, it may be wholesome for those who are now investing with the expectation that present or higher prices and profits will continue to consider the question of actual cost of making iron in the most favored districts, the number and capacity of furnaces building or proposed, and the probable requirements of the markets. We quote: No. 1 X, Foundry standard Lehigh brands, $19.50@$20; No. 2, $18@$18.50; Gray Forge, $16.50 @$17, with 50c.@$1 above these figures for "fancy" brands.

Scotch Pig.—The demand for this article is quiet, though prices are firm. The December dullness is felt, and no one wants to buy more than for current wants, in order to keep the stocks light for the end of the year. We quote: Coltness, $22; Gartsherrie, $21; Summerlee, $21@$21.50; Dalmellington, $19.50@$20; Langloan, $20@$20.50; Clyde, $19.50@$20; Glengarnock, $19.50@$20; Eglinton, $19@$19.50. Cables to the Metal Exchange to-day quote: Coltness, 50s.; Langloan, 47s.; Summerlee, 49s.; Gartsherrie, 46s. 6d.; Glengarnock, 44s. 6d.; Dalmellington, 43s. 6d.; Eglinton, 42s. 6d.; Warrants, 42s. 4d.; Middlesboro', No. 3, 32s. 3d.; Hematite Pig, 44s. 6d. Freights are 7s. 6d.@9s.

Bessemer Pig.—The market is quiet and strong. We quote $19.25 at furnace for Domestic, and $20 nominal for Foreign.

Spiegeleisen.—The demand continues active, and sales of several thousand tons are reported. We quote $27@$28 for German; $27.75@$28.50 for English 20 per cent.

Steel Blooms and Billets.—The demand for blooms and billets is steady, and is not affected appreciably by the lull that is noticeable in many other articles. Chateaugay charcoal billets, 3¾ inches, are worth $47@$47.50 at Plattsburg. We quote Rail Blooms, $28@$28.50 for Foreign. Billets, $30@ $30.50, according to size and quality.

Steel Plates.—We quote: Tank, 2·65@2·75c.; Boiler and Ship Plates, 3@3¼c.; Flanges, 3¼c.; Extra Flange and Fire-Box Plate, 4¼@4¼c.

The contracts have been signed for several of the new war ships, as announced in our factory notes, and work is to be commenced without delay. This will make a demand for a large amount of both steel and iron. We must, indeed, create some large demands if the innumerable new furnaces building all over the country are to be kept in blast when ready.

Steel Rails.—The mills are so full of orders that they are generally unwilling to take more at present prices, and are not ready to ask more than $35 and $36 at Eastern mills, and $38 in the West. We hear of sales at $36, Eastern mill, but only a very limited business has been done during the week. Higher prices still will be asked where the European prices permit, but at present the only effect of asking them would be to add to the cost of those already sold.

Structural Iron and Steel.—The demand continues extremely good. The Jersey City elevated road contracts are out, and will require a large amount of metal. We hear of several other large orders in the market, so that the mills will be kept full of work well on into the New Year.

We quote: Angles, 2⅛@2¼c.; Tees, 2½@2¾c.; Steel Angles, 2·50@2·60c. American Beams and Channels, 3@3½c., base from dock.

Merchant Steel.—We quote: American Tool Steel, 7½@10c.; special qualities, 11@20c.; Crucible Machinery, 4@4·50c.; Bessemer and Open-Hearth Machinery, 2½c., with a large and steady consumption.

Plate Iron.—The demand is good. We quote: Common Tank, 2¼@2⅜c.; Refined, 2 30@2½c.; Flange Iron, 3¼@3½c.; Extra Flange, 4@4·25c.

Bar Iron.—This article seems at last to feel some improvement, and better prices are asked in some cases. Nevertheless, no important improvement can be expected this month.

We quote: Refined at 1·75@2c.; Common, 1.65@ 1.75c.

Old Rails.—These are counted "scarce," with asking prices as follows: For Tees, $22@$23, and $23@$24 for Double-Heads.

Rail Fastenings.—We quote Spikes, 2·15@ 2·25c. a pound; Angle Fish-Bars, 1¾@2c.; Bolts and Nuts, 2·50@3c.

Scrap.—We quote $20 for Wrought Yard Scrap, with rather light demand.

Cast-Iron Pipe.—We quote $28 for 36-inch pipe to $35 for 4-inch.

Philadelphia. Dec. 2.

[From our Special Correspondent.]

The pig-iron market has been unusually quiet this week, owing to the approach of the holidays and to the unwillingness of the large buyers to pay the prices that most makers are asking. The fact that next year's prices have not been fixed, and the element of doubt concerning the ability of the companies to hold prices at $20, $19, and $18, as threatened, leads buyers, large and small, to wait awhile and see how things go. At the same time, there is a good deal of anxiety to buy, and, if makers were disposed to conciliate their customers, they could do a large business at this time. Four or five leading brokers have had inquiries this week for very large supplies of Forge iron for which $16@$16.50 was offered, but $16.50@ $17 stubbornly asked. Some grades of Gray Forge are held at $17.50, and two or three makers have nothing to sell below $18, or even at that. The only sales that have been heard of through brokers' offices in this city are a half-dozen lots, of 500 tons each, and about a dozen sales of lots ranging from 100 to 300. Foundry iron has been very quite and firm, and scarcely any thing is offering. The reason is, that the special brands that sold most readily are not to be had. There is no desire on the part of the stronger companies to precipitate business. A 100-ton lot sold to-day at $19.50.

Muck-Bars—Small lots of Muck-Bars were placed this week at $31.50. It is not likely that any thing less than $31 will be taken at mill.

Merchant Iron.—The chief demand this week has been at the stores, where 2 cents is paid in small lots without grumbling. From 25 to 100-ton lots have been taken at city and interior mills at 1·85@1·90c. for Refined and 1·75c. for Common, Common being the most active.

Sheet-Iron.—There is talk of an advance in sheet-iron, especially in small lots for January 1st. At present, card rates are maintained and a good business is done.

Plate and Tank Iron.—The plate and tank iron makers have not done much new business, and are waiting to see how things will look after the holidays. They are well sold up and in a position to stand back; buyers are not well supplied; there are inquiries from locomotive-works and car-builders for material, and the ship-yards will no doubt want a good deal of material before very long. Plate iron is $2.25@$2.30; Tank, $2.30@$2.40. It is intimated that something better could be done, provided two or three of the large buyers could be induced to put their orders together in one mill.

Nails.—Nails are rather quiet and dull this week at $2@$2.10.

Merchant Steel.—Merchant steel is strong and an advance is talked of, especially in tool steel. The tool-makers have been buying a good deal of stuff, and there are now contracts in hand that, when filled, will not be duplicated at less than a tenth more.

Structural Iron.—There is nothing new to report in Structural Iron. Angles are 2·15@2·20c.; Beams and Channels, 3c. The trade prospects are as good as at any time, and an immense amount of work will be wanted before spring.

Skelp Iron.—Skelp iron is 2c. Something less might be taken for a large order, provided the party could wait.

Steel Rails.—Quite a number of small lots, aggregating 3000 tons, were taken this week at $35 at mill. The rail-makers talk of stronger prices, but will not anticipate the market.

Foreign Material.—It is rumored that some business has been done elsewhere, but, so far as this market goes, we have not closed any large orders; prices are too high. Yesterday's imports of steel slabs were 5834 tons; besides 241 tons of spiegeleisen, 101 tons of iron rails, 294 tons of fish-plates, and three cargoes of iron ore.

Old Rails.—Old Rails are quiet at $22@$23, with scarcely any business done, because there are none to be had. Western Pennsylvania buyers are very anxious to have supplies.

Scrap.—No. 1 selected is quiet all the way from $20 @21.50, and there is not much business doing.

Pittsburg. Dec. 2.

[From our Special Correspondent.]

Activity in the iron market continues to be the rule. Higher prices are demanded for all descriptions of raw iron, while sellers exhibit an independence we have not been accustomed to for some time. Those who read our reports carefully will remember that, during October, we remarked that if we wanted iron we would buy it then. Iron is to-day one dollar a ton higher than when that remark was made. The heavy sales made are all for legitimate purposes, not speculative in order to make metal scarce and to advance prices. With rare exceptions, the metal is at once transformed into iron, to fill orders that have been waiting for some time. The furnaces here are well satisfied with the situation. They have fixed values, and are not disposed to lower their views. The daily consumption of raw material in Pittsburg and vicinity would astonish many of those even in the business, could they obtain a view of the figures. The demand for iron has been long kept up, and from present indications will continue; just how long is what no person can find out. While the Eastern pig-iron market is reported quiet, we are pleased to report that ours is just the reverse. Several brokers say that they could sell plenty of iron, but are not able to obtain a sufficient stock to meet current demands, as furnace-men in many cases refuse to sell at present. During the week, a large amount of iron ore, old rails, and pig-iron has been received by the Ohio River, with several large cargoes on the way, all delivering on previous contracts. There have also been some heavy shipments of steel rails by water to the South and West. Muck iron is firm and higher; old rails are advancing; scrap iron is firm and active; in fact, there never was a better demand for iron than at present at satisfactory prices.

Pig-Iron.—Following are the current rates:

Coke or bituminous:	$	$
Foundry No. 1	19.00@	19 50
Foundry No. 2	18.00@	18.50
Gray F., No. 3	18.00@	18.25
" " No. 4	10.70@	17.50
White	16 50@	
Mottled	16.25@	16.50
Silvery	16.50@	19.00
Bessemer	20.00@	
Charcoal:		
Foundry No. 1	22.50@	23.50
Foundry No. 2	22.00@	22.50
Cold-Blast	26.50@	29.00
Warm-Blast	24.00@	25.00
20 p. c. Spiegel	@	28.50

	$	$
Muck-Bar	31.00@	31.50
Steel Blooms	32.00@	36.00
Steel Slabs	30.00@	33.00
Steel Crop Ends	@	23.50
St'l Bl'm Ends	@	23.00
Old Iron Rails	26.00@	26.50
Old Steel Rails	25.50@	26 00
No. 1 W. Scrap	20.00@	20.50
No. 2 W. Scrap	18.00@	18.50
Steel Rails	36.00@	36.50
" light sect's	37.00@	40.00
Bar Iron	1.70@	1.80
Iron Nails (60 days)	2.10@	2.15
Steel Nails	2.15@	2.25

Tons.	SALES SINCE LAST REPORT.		
1000	No. 1 Mill, Coke and Coal S. L. Ore	$18.25	cash.
500	Gray Forge, " " "	18 00	cash.
300	imported Bessemer, " "	22.75	cash.
1500	Muck-Bars, spot	31.75	cash.
500	" " "	32.00	cash.
1000	" "	31.50	cash.
250	" "	31.50	cash.
500	" "	31.00	cash.
100	" "	31.25	cash.
400	" "	31 50	cash.
400	Steel Billets, imported	33.00	cash.
1000	Old Iron Rails, American, January	26.50	cash.
600	" " spot	26.50	cash.
500	" " "	26.00	cash.
200	Gray Forge, Coke Native Ore	18.00	4 mo.
100	Bloom Ends, imported	23.75	cash.
300	" " "	24.00	cash.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Dec. 3.

Statistics.

Production Anthracite Coal for week ended November 27th, and year from January 1st:

TONS OF 2240 LBS.	1886.		1885.	
	Week.	Year.	Week.	Year.
P. & Read. RR. Co..	*225,000	10,498,049	235,966	10,449,558
L. V. RR. Co.....	1'2,661	5,593,981	181,206	5,547,856
D., L. & W. RR. Co.	88,822	4,606,642	108,328	4,581,812
D. & H. Canal Co..	75,249	3,225,910	89,682	2,999,678
Penna. RR..... .	50,128	3,075,790	55,369	2,994,571
Penna. Coal Co.....	28 310	1,374,119	28,594	1,364,453
Penna. Canal Co...	12,063	470,951	12,124	425.528
Total..... ..	632,233	28,845,442	711,269	28,361,456
Increase	.....	483 986	.....	.....
Decrease	79,036	.....	.....	.....

The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production

Production for corresponding period:

1881..... ..26 100,763 | 1883..... ...29,169,265
1882 ..... . 26 980 664 | 1884... 28,325,931

* Estimated.

Production Bituminous Coal for week ended November 27th, and year from January 1st:

Tons of 2000 pounds, unless otherwise designated.

EASTERN AND NORTHERN SHIPMENTS.

	1886.		1885.	
	Week.	Year.	Week.	Year.
Phila. & Erie RR...	2,439	16.724	50	26,247
*Cumberland, Md..	62,294	2,290,435	67,027	2,554,607
*Barclay, Pa.....	3,173	163,566	3,508	212,713
*Broad Top, Pa.				
H. & Broad Top RR.	8,081	345,428	4,498	153,469
East Broad Top....	.....	. ....	.....	.. .
Clearfield Region, Pa.				
Snow Shoe.....	1,726	98,068	3,848	134,241
Karthaus (Keating)	3,221	130,217	2 828	120,966
Tyrone & Clearfield	48,059	1.994,428	56,050	2,624,525
Alleghany Region, Pa.				
Gallitzin & Mountain	9,901	612,690	11,995 .	491,822
Pocahontas Flat Top Coal.				
Norf'k & West. RR.	19.296	780,666	11.324	538.487
Kanawha Region, W. Va.				
Ches. & Ohio RR.. .	25,742	1,115,750	27,576	1,000,998
Total 153,932		8,547,972	188,704	7,858,075

* Tons of 2240 lbs.

WESTERN SHIPMENTS.

Pittsburg Region, Pa.				
West Penn RR.....	4,833	288 141	4,016	200,562
SouthwestPenn.RR.	1,749	140 114	2,138	92,230
Pennsylvania RR .	6,046	254.117	3.948	217,184
Westmoreland Region, Pa.				
Pennsylvania RR...	25.952	1,144.961	29,423	1,065,311
Monongahela Region, Pa.				
Pennsylvania RR...	7,973	365.265	4,271	249,943
Total.....	46,553	2,192,598	43.796	1,825 230
Grand total..... ...	200 485	10,740.570	232,500	9,683,305

Production of Coke on line of Pennsylvania RR. for week ended November 27th, and year from January 1st:

Tons of 2000 pounds.

	1886.		1885.	
	Week	Year.	Week.	Year
Alleghany Region.	6,108	176,451	3,471	168,492
West Penn. RR....	2.202	98.354	1.580	52,028
Southwest Penn.RR	62,655	2,455.818	47,776	1,660,122
Penn. & W. Region	7 669	301,054	5.402	216,945
Monongahela	3,163	131,242	1,896	85,778
Pittsburg Region..	.....	108	.....	.....
Snow-Shoe..... .	432	25,448	596	21,894
Total.....	82,229	3,188,475	56,721	2,205,259

Anthracite.

Since our last, the general sales-agents have met, and although a mild kind of a row was expected, every thing passed off harmoniously. It was feared that the Pennsylvania Coal Company would disturb the market by issuing a circular at prices somewhat under the circulars of other companies. Certain explanations, however, were made, which were acceptable to that company, and it agreed to make no change in prices. One of the companies was accused of selling stove coal at less than circular prices. This was admitted by the company, with the satisfactory explanation that the quantity was less than 10,000 tons; that it had been in stock about a year and was rusty; and that, in order to clear up stocks at the end of the season, a sacrifice was necessary.

The cold weather that set in on Wednesday night has greatly improved the tone of the market, while at the same time it has increased the demand. It is thought there will be a very large amount of coal needed, if the cold weather should continue much longer. It is stated that a great many dealers in this city and vicinity, and in the East, have permitted their stocks to run low, in expectation that the usual weakness in prices in December would be repeated this year. It is stated by good judges that their requirements will greatly stimulate prices as soon as it is evident that the companies are determined to pursue a policy of restriction so marked as to permit them to secure such prices as the market will justify.

It is estimated that the entire stock of coal with companies at the beginning of December was not over 500,000, nearly one half of which was stove coal, and that under a smaller output this month, as compared with last year, the companies will have 750,000 tons less coal to take care of, and, if the weather continues seasonable, a much better demand than last year. Under the circumstances, the outlook is more encouraging at this time in the year than it has been for many years past. A very encouraging feature this year is, that the combination question will not of necessity have to receive consideration in the dullest period of the year.

Two weeks ago, chestnut coal was somewhat easy. It appears, now, however, that it has become very scarce, and full circular price is easily obtained. Pea coal is also quite scarce, and good qualities readily bring the circular price. Broken is somewhat heavy, and egg a little better off. Stove coal is in more active request, with a rising tendency.

The demand from the West is still very great, and will absorb all the transportation facilities that will probably be available during the winter, and still leave but a scant supply.

We quote ordinary free-burning coals, net., f.o.b. vessels at the shipping ports as follows:

	Week ended—		
	Dec. 3.	Nov. 26.	Nov. 19.
Lump	$3.40	$3 40 ...	$3.40 ....
Steamboat.....	3.40	3.40	3.40 .....
Broken.....	3.30	3.30	3.30@3.40
Egg	3.65	3 65 . ..	3.65 ....
Stove	3.90@4.10	3.80@4.10	3.85@4.10
Chestnut.....	3.50 .	3 35	3.35@3 45
Pea.....	2.10@2.25	2.10	2.10 .....
Buckwheat....	1.60	1.50	1.50@1.65
Dust.....	1.20 .	1.20	1.20 ... .

The Reading Company had 28,921 tons of coal in stock at Port Richmond on Saturday, an increase of 8852 tons for the week.

Bituminous.

There has been a fair inquiry for this class of coal, but in the absence of supplies, but little business has been done. Cars are still scarce. Prices range between $3.25 and $3.35 per ton alongside in this city for good coal. There is an inclination to cut prices in some quarters, but as a whole the market is very much better, and most producers are earnestly endeavoring to maintain prices upon a basis which will show some profit on the business. The producers continue to speak very encouragingly of the prospects of forming a combination to regulate the trade.

Buffalo. Dec. 2.

[From our Special Correspondent.]

Navigation by canal is closed for the season. A few vessels are expected to arrive by lake, and perhaps two or three craft may yet clear if the weather permits. The record of 1886 has been very prosperous, from a business point of view, as far as freighting and receipts and shipments were concerned; but the insurance interests have suffered to an extraordinary degree from the severe storms of November, added to which the sad "loss of life statistics" will foot up to a large total. The coal shipments by lake were the largest ever recorded, and the freight rates obtained the highest average known for many years.

There has been the usual trouble shown at a meeting of freight line officials now in session in our city, relative to deviations from the anthracite coal tariff on West-bound coal from Buffalo and other points. The charge of cutting rates was generally admitted, but it appeared that all lines were equally guilty. Harmony prevailed at last, and a settlement was arrived at that the published tariff of November 1st, 1885, on the basis of $2 per gross ton from Buffalo to Chicago, should be maintained on and after January 1st, 1887, until further notice.

The prices of anthracite coal are unchanged. Coke is without any quotable variation.

The great scarcity of cars that has prevailed for some time, and which still exists, has caused a firm tone to prevail in the bituminous coal trade, and prices have advanced fully 30 cents a ton. Several dealers and producers are in a quandary, as they can not fill their contracts, and, as a resu't, there is considerable trouble among consumers, and legal proceedings are threatened in some instances. Shortage of stocks of soft coal are reported at Cleveland, Toledo, Chicago, and many points in Canada. Our dealers and miners located here state that they have done a very large business this year.

With reference to the New York dispatch of November 30th, sent over the country by the Associated Press agent, the manager of one of the largest bituminous coal firms in this part of the State says, in substance, "There was no meeting, and if there is to be one for the purpose, it is not a scheme that particularly affects Buffalo. It is a New York fight." The same party went on to say that "the price of bituminous coal for years has been so low that all the railroads that have drawn it to Buffalo are in the hands of receivers. There is a great scarcity of soft coal just now, and it has put holders in a position to get a fair price for it. There was a time when the Buffalo, New York & Pittsburg Railroad received $1.40 for hauling coal, and it has been as low as 50 cents to Buffalo." He concluded thus: "If we could get 300 car-loads of soft coal a day, we could find sale for it."

A dispatch from Pittsburg says that the statement that there is to be a further and immediate advance of 25 to 30 per cent in bituminous coal is denied by all the prominent operators in Ohio and Western Pennsylvania.

Natural gas will be burned in our city to-morrow or Saturday. Yesterday, connections were made, and the preliminary work completed. Last evening, the gas was turned on from Salamanca, and in about thirty minutes afterward, in the midst of a howling snow-storm, it arrived in Buffalo. A light was applied; a loud report followed; and then a stream of reddish flame, eighty feet long, illuminated the surroundings.

Now for some statistics:

The receipts of coal by lake at this port, thus far this season, are only 520 net tons. The shipments to Western and lake ports for the month of November, 211,560 net tons, as compared with 203,940 net tons in 1885, and 93,430 net tons in 1884; for the season to December 1st, 1,558,900 net tons, as compared with 1,495,510 net tons in 1885, and 1,363,610 net tons in 1884.

The principal points of distribution of the coal shipments by lake from this port for the season of navigation to December 1st were as follows: 623,600 net tons to Chicago, 370,600 to Milwaukee, 55,000 to Toledo, 157,500 to Duluth, 25,000 to Racine, 7000 to Sandusky, 31,000 to Detroit, 24,000 to Green Bay, 11,500 to Sheboygan, 4650 to Bay City, 4000 to Ashland, 5000 to Windsor, 1500 to Evanston, 65,000 to Superior City, 1700 to Muskegon, 6000 to Kenosha, 10,000 to Washburn, 11,600 to Saginaw, 2800 to Kincardine, 4200 to Hancock, 1700 to Manitowoc, 13,600 to Marquette, 5000 to Port Huron, 2000 to Fort Williams, 1000 to Amherstberg, 1000 to Alpena, 1730 to St. Joseph, 2700 to Escanaba, 1350 to Houghton, 3290 to Port Arthur, 2600 to Menominee, and 1000 to Ste. Marie. In addition is the quantity shipped via Tonawanda vessels, but destination of cargoes not reported at Custom-House or elsewhere.

NOTE.—The shipments for the past week comprised 13 cargoes to Chicago, aggregating 18,580; 6 cargoes to Milwaukee of 7600; and 3 to Detroit of 1850 net tons; making total shipment of 28,030 net tons.

Lake freights closed at $1.50 to Chicago and Milwaukee, as compared with $1.25 in 1885, and $1 in 1884.

The receipts of coal at this port by canal for the month of November were 8830 net tons; thus far this season, 81,496 net tons, as compared with 186,836 net tons in 1885, and 151,651 in 1884. The shipments for the month of November, 2105 net tons; thus far this season, 19,677 net tons, as compared with 27,032 net tons in 1885, and 31,958 in 1884.

No statistics are at hand of the movement to and from Buffalo by railroads.

The New York State canals and the Welland Canal closed yesterday.

The *Lake Superior News* says that "the St. Paul, Minn., coal dealers are indignant because of the rumor of an impending coal famine, which was to spring from a disability of the railroads to furnish cars. They say the roads do furnish cars as fast as wanted, and they always have a great many on track loaded. They are right, of course, in regard to the railroads; but as to the impending fuel famine, they are not correct. Let us see: the total coal receipts at Duluth for the year will not be over 600,000 tons, about the same as last year, while conservative coal men estimate the increase of demand at fully 150,000 tons, and more if the winter is severe. One hundred and fifty thousand or 200,000 tons is considerable."

Boston. Dec. 1.

[From our Special Correspondent.]

The slump in the anthracite branch of the coal market seems to have been checked. The market here has stiffened up with the ground, owing to colder weather,

as was anticipated would be the case. Rumors of cutting by the companies have been notable for their absence, and coal offered by individual miners is more firmly held. We have heard of $4 being asked f.o.b. at New York for the same coal that has been selling at $3.90. As low a figure as $3.85 can still be had on Stove. Egg remains scarce and high at $3.80. Broken is in moderate supply at $3.40@$3.55; Chestnut is about as hard to get as any size and the price has in effect been advanced. Where $3.40 f.o.b. would secure a cargo a week or so ago, $3.65 is now asked. Pea coal is also scarce, because of heavy sales during the strike

At last, we have an actual advance in bituminous coal. The general press dispatches make the advance 25 cents a ton, but it is really 15 to 20 cents. The f.o.b. prices have been $2.10@$2.15, and $2.30 is now the minimum both at Philadelphia, Baltimore, and the lower ports. The advance in freights at Philadelphia at this time of the year is supposed to equalize delivered prices. It is impossible as yet to say whether this price can be maintained, as there is no trade to mention, and very little desire manifested to take on contracts.

There is nothing new in freights. Vessels have been rather scarce at Philadelphia. A few vessel-owners have talked of boycotting the Boston Tow-Boat Company because that corporation runs a line of coal barges. It will doubtless end in talk. The barges are doing well.

We quote vessel rates, exclusive of discharging, as follows:

New York, 80@90c.; Philadelphia, $1@$1.10; Baltimore, $1.10@$1.15; Newport News and Norfolk $1.05@$1.10; Richmond, $1.10@$1.15, Cape Breton, $1.85@$2; Bay of Fundy, $1.60.

There is a little more doing at retail. We quote delivered prices as follows:

White ash, furnace and egg	$5 00@$5 25
" stove and nut	5 25@ 5.50
Lehigh furnace, egg and stove	5.50@ 5 75
" nut	5.50@ 6.00
Shamokin egg	5.50@ 6.00
" stove	5.75@ 6.00
Lorberry egg and stove	@ 6.50
Franklin egg and stove	@ 7 00

Pittsburg. Dec. 2.

[From our Special Correspondent.]

Steady, not very active for the two weeks ended November 30th. The coal shipment by the Ohio River reached 17,040,000 bushels, as follows: For Cincinnati, 6,814,000 bushels; Louisville, 10,236,000. There was a heavy decline in the Cincinnati and Louisville markets. Prices declined from 13c. afloat to 6@7c., with a dull market. It is estimated that the coal shipments from the Kanawha River and Pomeroy will reach from 3,000,000 to 3,500,000 bushels. This, together with Pittsburg run, will supply the market for a long time, and keep prices down to a low figure. The principal part of the Louisville run will be forwarded to the Southern markets. The miners are talking strike again. The general opinion is, that no advance will be made.

Price of coal here afloat: River, wholesale, 4@5c.; Railroad, 4½@5c.

Connellsville Coke.—The price for December is the same as November: Blast-Furnace, $1.50 f.o.b. cars at works; Foundry, $1.75; Crushed, $2.25. The demand for an advance was refused; the manufacturers were a unit on that subject.

FINANCIAL.

Mining Stocks.

NEW YORK, Friday Evening, Dec. 3.

The mining market during the past week has experienced a "boom" of immense proportions, and speculation has been at fever heat. The excitement that prevailed at certain times at the Exchange is beyond description. The climax was reached on Thursday, when prices were at the highest point, and business showed sales aggregating 685,000 shares, of which Sutro Tunnel alone contributed 411,000 shares. The advance in all the stocks was led by the Comstocks, owing to reports of continued improvement in Consolidated California & Virginia; but this is no justification for the wild speculation that has arisen. In this market, low priced "fancy" stocks, of no actual value, have been advanced in sympathy, and transactions have been large. The total number of sales reported for the week was 1,465,181 shares. Prices were on the upward move, and continued so in most cases, excepting the break in the Comstocks to-day, due, it is said, partly to the failure and flight of L. B. Franklin & Co., of Virginia City, for $915,000, which carried down also Greenbaum & Strauss, of San Francisco. The Comstock boom is generally supposed to be based simply on a "corner." Of course, there is no real value in most of the mines that are now selling at such high figures.

Consolidated California & Virginia during the week advanced from $22.50@$48 and $50 on Thursday, but declined to-day to $44 and $40. This movement is probably in sympathy with the San Francisco market. The reports from the company's mines are said to be favorable. Large shipments of bullion are reported, and a dividend is spoken of. Such a move would probably again send the price upward, unless the source of the bullion is suspected or the size of the small bonanza measured; $75 and $100 is spoken off, but this is all in the air, and there is no foundation for it in the mine. Sutro Tunnel was the trump played on Thursday, when the price advanced from 27@58c. At the beginning of the week, it stood at 18c.; closing quotations to-day stood at 45c. This stock is probably absolutely worthless. Best & Belcher, of which but a few sales were made, went from $9@$23.25. Sierra Nevada advanced from $4@$13.50 on Thursday, declining to $10.50 to-day. Hale & Norcross, from $3.70@$10. Yellow Jacket, from $3.50@$12; Union Consolidated, from $3.75@$10. Savage, from $10@$15. Gould & Curry, from $5.25@$9. One sale of Ophir was made at $13.75. Navajo was active, and showed an upward tendency, going from 85c.@$2.10. North Belle Isle was quiet at $6; and Belle Isle, at from 31@90c.

Eureka shared in the upward movement, advancing to $10 on Thursday, but declining again to $8 to-day. Martin White was firm at from 70 to 85c.

The State Line "Cats" are out again. Nos. 1 & 4 made their appearance at 4c., and sold up to 12c., declining to-day to 8c.; Nos. 2 & 3 at 4c., went up to 11c., and declined to-day to 7c. Oriental & Miller was more fortunate, and demanded considerable attention, which brought the price from 14@30c.

The Bodies were out in full glory! Bodie Consolidated, the old time favorite, was not forgotten in the general advance, and went from $2.80@$4.50 to-day. Bulwer gained one dollar; the highest point reached was $2.15; to-day, $2.05. Standard, which has been sorely neglected of late, came forward on Tuesday at $1.25; to-day, it was quoted at $2. Mono fluctuated between $2.99 and $4.25. The great rush yesterday also brought North Standard, of which nothing has been heard or said for months, at 25 and 24c. Little was done in Consolidated Pacific, at from 40@80c.

Gold Stripe shows large sales at from 5@9c. Green Mountain, a few shares at 40 and 42c. Taylor-Plumas, from 25@50c.

The Colorado stocks were among the favorites, with higher prices. The largest transactions are recorded in Amie's ghost, which has now been doomed by the Exchange Committee, and can not appear on the list after the 1st of January, 1887. The total sales amounted to 189,300 shares, at from 2@12c. Little Chief was active; the price was firm at from 34@40c. Leadville fluctuated between 60@70c.; and Little Pittsburg, between 70 and 85c. Chrysolite advanced from 66@92c. Bassick, which exists only in name, advanced from 26@38c., and sold again to-day as low as 24c. Robinson Consolidated was quiet at 50@54c. Red Elephant also gained a few points, going from 3@12c. New Pittsburg, which has just been listed, sold at first at 22c., but quickly advanced to 50c.

Homestake held its own at $17@$16. Deadwood-Terra went up to $3.40 on Wednesday, but declined again to $2.95 to-day. Father de Smet is selling at from 90c.@$1. Caledonia, on which an assessment of 15c. has been levied, opened at $1.25 on Thursday, sold at $1.65, and to-day at $1.35.

Little is doing in Horn-Silver, which declined from $2.05@$1.70. Stormont was active at from 14@22c. Castle Creek, which had its large advance last week, fluctuated between 18c. and 22c., but it is rumored that higher prices will be reached if the new sluicing-machines to be started up on the 15th inst. prove successful.

There is a movement on foot to "boom" Rappahannock. Large shipments of stock to England have been made. The sales were 174,300 shares at from 12@26c.

On the whole, our report is interesting reading, and if we could give the slender foundation on which the "boom" in most cases rests, it would be an admirable example of how silly some people can be when they take to gambling. As a rule, the stocks of real value advanced the least, and those in some cases that represent neither a mine nor even an organization, advanced to the value of a dividend-paying mine.

Coal Stocks.

As we foreshadowed a week ago, the speculation, which at that time was largely centered in the fancies, has been turned to the old-time favorites. On Tuesday, money was bid up to 20 per cent, and the banks showed a disinclination to loan on the fancies at all, and when they did so, at very high rates and much under the market prices for the stocks. This precipitated a general break in the market, in which Reading suffered more than any of the other popular stocks, although only losing about a third of the gain made during ten days. For a time, those who were not familiar with the manipulation and the position of the leaders in the market were badly scared; but on Wednesday, it was evident to all that the decline was for the purpose of shaking out a weak following, and that there was as strong an undertone to the market as at any time heretofore. The foreign buying in this market is a quantity difficult to measure; but it is evidently much larger than ever before, and a very great sustaining force.

It now seems doubtful whether the Reading reorganization plan will be made public this week. Insiders appear to be very hopeful of the future value of the stock, and are advising their friends to hold for much higher prices.

The Jersey Central management has notified the Reading Company that it will take over its property on January 1st. The stock has had a rising tendency. It is thought that some strong party is buying it for control. An issue of receiver's certificates is expected.

Mr. S. V. White has not been here this week to take care of Lackawanna. He is expected back on Monday, and should the coal trade continue to improve, it is not impossible that the upward movement in that stock will begin to-day and continue. Of course, if this should be the case, Delaware & Hudson should act in sympathy.

The daily press has been following our cue on Cameron Coal and completely riddling it. The stock is so manipulated, however, that it has not been permitted to decline much.

Colorado Coal has been active and is higher, while Tennessee Coal and Iron has had a big advance, due to the general boom that has apparently carried it far beyond its value.

Meetings.

The annual and special meetings of the following companies will be held at the times mentioned:

Chicago Rolling-Mill Company, No. 17 Metropolitan Block, Chicago, Ill., December 31st, at eleven o'clock A.M., special meeting to consider and vote upon the question of increasing the capital stock of said company from five million dollars to six million dollars.

Dayton Mining Company, office of F. O. Clark, Marquette, Michigan, December 28th, at nine o'clock A.M., special meeting for the purpose of taking measures to provide for payment of the debts of the company, and also, if necessary, to give authority to the directors to sell the property, both real and personal, owned by the company, for the purpose of paying the company's indebtedness.

Fort Pitt Coal Company, No. 1010 Penn avenue, Pittsburg, Pa., December 9th, at ten o'clock A.M., special meeting to devise measures for continuing or discontinuing the business of the company.

Gipsey Maid Mining Company, No. 53 Broadway, New York City, December 20th, from two to three o'clock P.M.

Mikado Mining Company, office of M. Van Orden, Houghton, Michigan, December 11th, at two o'clock P.M., first meeting.

Morris & Essex Mutual Coal Company, Courtelyou's Hotel, Portland, Pa., December 6th, from twelve o'clock M. to one o'clock P.M.

Passaic Zinc Company, Jersey City, New Jersey, January 4th, 1887, from twelve o'clock, M. to one o'clock P.M.

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par value	Assessments. Total levied to date.	Assessments. Date and amount per share of last.	Dividends. Total paid to date.	Dividends. Date and amount per share of last.
1	Adams, s. L	Colo.	$1,500,000	150,000	$10	*		$525,000	Nov. 1886 15
2	Alice, s. c	Mont	10.000,000	400,000	25	*		750,000	Sept 1886 .06¼
3	Amie Con., s. L	Colo.	5,000,000	500,000	10	*		339,000	Oct. 1883 .05
4	Amy & Silversmith, s.	Mon.		311,419				176,710	Nov 1886 .10
5	Atlantic, c	Mich	1,000,000	40,000	25	$240,000	Apl. 1875 $1.00	320,000	Jan. 1886 $1.00
6	Argenta, s	Nev.	10,000,000	100,000	100	290,000	July 1885 .10	40,000	Feb. 1880 .20
7	Barbee & Walker, s.	Utah	1,000,000	100,000	10	*		60,000	Nov 1880 .10
8	Bassick, G. S	Colo.	10,000,000	100,000	100	*		400,000	Mar. 1881 1.00
9	Belle Isle, s	Nev.	10,000,000	100,000	100	140,000	May 1886 .10	300,000	Dec. 1879 .25
10	Belcher, G. S	Nev.	10,400,000	104,000	100	2,217,345	ec 1885 .30	15,397,000	Apl. 1876 1.00
11	Bellevue Idaho, s. L	Idah.	1,250,000	125,000	10	26,250	Dec. 1883 .10	150,0 0	Nov 1886 .10
12	Big B'nd Hydraulic, G	Dak.	1,000,000	200,000	5	*		204,000	Nov. 1886 .03
13	Black Bear, G	Cal.	3,000,000	30,000	100	22,500	Dec. 1884 .25	895,000	May 1883 .20
14	Bodie Con., G. S	Cal.	10,000,000	100,000	100	324,990	Jun. 1886 .50	1,602,572	Apl. 1885 .50
15	Bonanza Developm't	C & M	3,000,000	300,000	10			135,000	Oct. 1882 .15
16	Bonanza K'g, Cons. s.	Cal.	1,000,000	100,000	10	*		185,000	Feb. 1885 .10
17	Boston & Mont, G	Mont	2,500,000	250,000	10	*		520,000	Jun 1886 .15
18	Breece, s	Colo.	5,000,000	200,000	25	*		2,000	Feb. 1880 .01
19	Brooklyn Lead, L. S	Utah	500,000	50,000	10			102,000	Sept 1886 .05
20	Bulwer, G	Cal	1,000,000	100,000	100	40,000	Oct. 1885 20	175,000	Jan. 1884 .10
21	Caledonia, G	Dak	10,000,000	100,000	100	520,000	Nov. 1886 .15	40,000	Feb. 1886 .10
22	Calumet & Hecla, C	Mich	2,500,000	100,000	25	1,200,000		28,350,000	Nov. 1886 5.00
23	Carbonate Hill, s. L	Colo.	2,000,000	200,000	10	*		80,000	Apl. 1884 .05
24	Caribou Con., s	Colo.	1,500,000	150,000	10	*		50,000	Mch 1880 .10
25	Castle Creek, G	Idah.	100 000	100,000	1			51,000	Oct. 1883 .03
26	Cataipa, s. L	Colo.	3,000,000	300,000	10	*		270,000	May. 1884 .10
27	Central, C	Mich	500,000	20,000	25	100,000	Sept 1861 .06	1,780,000	Jan. 1886 2.00
28	Christy, s	Utah	10,000,000	100,000	100			10,000	Jun. 1885 .10
29	Chrysolite, s. L	Colo.	10,000,000	200,000	50	*		1,650,000	Dec. 1884 .25
30	Colorado Central, s. L	Colo.	2,750,000	275,000	10	*		171,250	Dec. 1886 .10
31	Cons. Cal. & Va., G. S.	Nev..	21,600,000	216,000	100	108,000	Jan. 1885 .20	64,800	Feb. 1886 .30
32	Con. Gold Mining, G.	Ga...	500,000	100,000	5	*		108,000	Nov. 1883 .02
33	Contention, s	Ariz.	12,500,000	250,0 0	50			2,587,000	Dec. 1884 .25
34	Crescent, s. L. G	Utah	15,000,000	600,000	25	±		210,000	Aug. 1886 .05
35	Crown Point, G. S	Nev..	10,000,000	100,000	100	2,675,000	Feb. 1882 .25	11,588,000	Jan. 1875 2.00
36	Deadwood-Terra, G	Dak..	5,000,000	200,000	25	*		§900,000	Jan. 1883 .10
37	Derbec B. Grav., G. S.	Cal..	10,000,000	10 0,000	100	90,000	Dec. 1881 .10	140,000	Jun. 1886 .10
38	Dunkin, s. L	Colo.	5,000,000	200 000	25	*		220,000	Sept 1884 05
39	Elkhorn, G. S	Mont	1,000,000	100,000	10	50,000	July 1883 .50	140,000	Sept 1886 .50
40	Eureka Con., G. S. L.	Nev..	5,000,000	50,000	100	500,000	July 1886 1.00	4,817,500	July 1882 .25
41	Evening Star, S. L	Colo.	500,000	30,000	10	*		1,400,000	Nov 1883 .50
42	Excelsior, G	Cal..	10,000,000	100,000	100	560,000	Sept 1885 1.00	875,000	Oct. 1880 .25
43	Father de Smet, G	Dak..	10,000,000	100,000	100	200,000	Nov. 1878 1.00	1,125,000	Dec. 1885 .20
44	Franklin, C	Mich	1,000,000	40,000	25	220,000	Jun. 1871	52,000	Jun 1886 1.00
45	Freeland, G. S. C	Colo.	5,000,000	200,000	25	*		193,000	July 1886 .10
46	Fresno Enterprise, G	Cal..	5,000,000	100,000	50		Mch 1883 .10	110,000	July 1882 .10
47	Gould & Curry, G. S.	Nev..	19,800,000	108,000	100	4,055,000	Sept 1886 .50	3,826,000	Oct. 1870 10.00
48	Grand Central, s	Ariz.	1,000,000	100,000	10			625,000	Dec. 1882 .25
49	Grand Prize, s	Nev..	10,000,000	100,000	100	570, 0	Apl. 1886 .50	495,000	Mar. 1884 .25
50	Granite, s	Colo.	125,000	125,000	1			6,250	May 1883 .01
51	Granite Mountain, s.	Mont	10,000,000	400,000	25			1,600,000	Nov. 1886 .25
52	Green Mountain, G	Cal..	1,250,000	125,000	10	*		212,000	Nov. 1881 .07½
53	Hale & Norcross, G. S	Nev..	11,200,000	112,000	100	4,974,80	Oct. 1886 .40	1,598,000	Apl 1871 5.00
54	Hall-Anderson, G	N. S..	150,000	150,000	1			7,000	Jan. 1882 05
55	Hecla Con., s. G. L. C	Mont	1,500,000	30,000	50			1,032,000	July 1886 .50
56	Hel'a Mg & Red, G. S. L	Mont	3,315,000	663,000	5	*		197,97)	July 1886 .06
57	Holmes, s	Nev..	10,000,000	100,000	100	300,000	Sept 1885 10	75,000	Apl. 1886 .25
58	Holyoke, G	Idah.	200,000	200,000	1			27,000	Feb. 1883 .10
59	Homestake, G	Dak.	12,500,000	125,000	100	200,000	July 1878 1.00	3,663,750	Dec 1886 .40
60	Honorine, s. L	Utah	500,000	250,000	2	25,000	Jun. 1883	75,000	Sept 1886 .05
61	Hope, s	Mont	400,000	8,000	50	*		158,252	Oct. 1884 1.50
62	Horn-Silver, s. L	Utah	10,000,000	400,000	25	*		4,000,000	Nov. 1884 .50
63	Idaho, G	Cal..	310,000	3,100	100			3,750,000	Jun. 1886 7.50
64	Ideal, s L	Colo.	1,500,000	150,000	10			15,000	Oct. 1886 .05
65	Independence, s	Nev..	10,000,000	100,000	100	340,000	Oct. 1886 .20	225,000	Sept 1879 .25
66	Indian Queen, s	Nev..	250,000	125,000	2			368,750	July 1883 03
67	Inyo, G	Cal..	500,000	100,000	5	*		45,000	Apl. 1882 .05
68	Iron Hill, s	Dak.	2,500,000	250,000	0	82,500	Oct. 1885	112,500	Oct. 1886 .05
69	Iron-Silver, s. L	Colo.	10,000,000	500,000	50	*		1,800,000	Dec 1886 20
70	Jackson, G. S	Nev.	5,000,000	50,000	100	10,000	Nov. 1880 .20	45,000	Oct. 1886 .10
71	Jocuistita, s	Mex.	2,500,000	250,000	10			1,200,000	Feb. 1885 .50
72	Kentuck	Nev..	3,000,000	30,000	100	342,000	Nov 1881 .30	1,600,000	Nov. 1886 .10
73	La Plata, S. L	Colo.	2,000,000	200,000	10	*		610,000	Sept 1882 .30
74	Leadville Cons., S. L	Colo	4,000,000	400,000	10	*		410,000	Oct. 1886 .05
75	Lexington, G. S	Mont	4,000,000	40,000	100	*		565,000	Jan 1885 2.00
76	Little Chief, S. L	Colo.	10,000,00	200,000	50	*		780,000	Mch 1885 .10
77	Little Pittsburg, S. L	Colo.	20,000,000	200,000	100	*		1,050,000	Mch. 1880 .50
78	Manhattan, s	Nev..	5,000,000	50,000	100	150,000	July 1879 1.00	437,500	Feb 1886 .25
79	Marguerite, G	Cal..	500,000	25,000	20	*		18,750	Oct. 1882 .25
80	Marion Bullion, G	N.C	500,000					15,000	Jan. 1886
81	Martin White, s	Nev .	10,000,000	100,000	100	1,150,000	Mar. 1886 25	115,000	Oct. 1886 .25
82	Minnesota, C	Mich	1,000,000	40,000	25	420,000	Apl. 1886 1 00	1,825,000	Mar 1876
83	Mono, G	Colo.	5,000,000	50,000	100	560,000	Jun. 1885 .50	12,500	Mar 1886 .25
84	Montana, Lt., G. S	Mont	3,300,000	330,000	10	*		795,000	Oct. 1886 .62
85	Morning Star, S. L	Colo.	1,000,000	100,000	10			650,000	Oct. 1886 .25
86	Moulton, S. G	Mont	2,000,000	400,000	5	*		290,000	Aug 1886 .07½
87	Mount Pleasant, G	Cal.	150,000	150,000	1	*		105,000	Mar. 1884 .10
88	Mt. Diablo, s	Nev	5,000,000	50,000	100	137,500	Jun. 1880 2.00	80,000	July 1885 .20
89	Napa, G	Cal..	700,000	100,000	7			290,000	Jan. 1883 .10
90	Navajo, G. S	Nev..	10,000,000	100,000	100	395,000	Mar. 1886 25	325,000	Feb. 1885 .25
91	N. Hoover Hill, G. S.	N. C.	300,000	120,000	2½	*		30,000	Dec. 1885 .06½
92	New York Hill, G	Cal..	5,000,000	50,000	100	62,500	Oct. 1885 .15	215,000	Aug. 1882 .10
93	Northern Belle, s	Nev..	5,0 0,000	50,000	100	425,000	Jan. 1884 8.50	2,400,000	Apl. 1883 50
94	North Belle Isle, S	Nev..	10,000,000	100,000	100	150,000	Mar 1886 .20	30,000	Aug. 1881 .15
95	Ontario, S. L	Utah	15,000,000	150,000	100			7,850,000	Nov. 1886 .50
96	Ophir, G. S	Nev.	10,000,000	100,000	100	3,937,800	Jun. 1886 .25	1,595,000	July 1882 1.00
97	Original, S. C	Mont	1,500,000	60,000	25	*		114,000	Oct. 1884 .05
98	Osceola, C	Mich	1,250,000	50,000	25	480,000	Apl. 1876 1.60	972,500	Sept 1884 .25
99	Oxford, G	N. S.	125,000	125,000	1	*		34,500	Oct. 1885 .02
100	Paradise Valley, G. S	Nev.	10,000,000	100,000	100	47,000	Mar. 1882 .15	130,000	Sept 1886 .25
101	Peacock, S. G. C	N.M.	2,000,000	200,000	10	*		60,000	Nov. 1886
102	Pleasant Valley, G. S.	Cal..	10,000,000	100,000	100	40,000	Mar. 1884 .10	30,000	Dec. 1882 .05
103	Plutus, G. S. C. L	Colo.	2,000,000	200,000	10	*		20,000	Feb. 1886 .10
104	Plymouth Con., G	Cal..	5,000,000	100,000	50	*		1,825,000	Dec. 1885 .25
105	Prussian, S. L	Colo	1,500,000	150,000	10			132,000	Jan 1883 .10
106	Quicksilver, pref., Q	Cal..	4,300,000	43,000	100			785,150	Aug. 1886 1.25
107	" com., Q	Cal	5,700,000	57,000	100			151,000	July 1882 .40
108	Quincy, C	Mich	1,000,000	40,000	25	200,000	Dec. 1862	4,410,000	July 1886 2.00
109	Richmond, S. L	Nev..	1,350,000	54,000	25	*		4,177,587	May 1883 1.25
110	Ridge, C	Mich.	500,000	20,000	25	220,000	Mar 1886 .50	100,000	Feb. 1880 .50
111	Rising Sun, s	Dak..	750,000	150,000	5	*		52,000	May 1881 .07½
112	Robinson Con., S. L	Colo.	10,000,000	200,000	50	*		585,000	Mar. 1886 .05
113	Robert E. Lee, S. L	Colo	10,000,000	500,000	20			100,000	Dec. 1882 .10
114	Rooks, G	Va...	500,000	50,000	10	*		61,000	Apr 1885 .30
115	San Francisco, C	Cal.	5,000,000	50,000	100	45,000	Sept 1880 .50	20,000	Feb. 1884 .05
116	Savage, s	Nev..	11,20 ,000	112,000	100	6,156,000	Jun. 1886 .50	4,490,000	July 1859 3.00
117	Security L. Mg, Mfg	Colo.	1,000,000	100,000	10	*		50,000	July 1884 .01
118	Shoshone, G	Idah	150,000	150,000	1			7,500	Apl. 1883 .01
119	Sierra Buttes, G	Cal..	225.000	22,500	10			1,438,964	Oct. 1886 .37
120	Sierra Grande, s	N. M.	2,500,000	500,000	5			860,000	Sept 1884 .25
121	Sierra Nevada, G. S.	Nev.	10,000,000	100,000	100	5,972,698	Sept 1886 .25	102,000	Jan. 1871 1.00
122	Silver Cord, G. S. L	Colo.	5,000,000	500,000	10			225,000	Nov. 1883 .25
123	Silver King, s	Ariz.	10,000,000	100,000	100			1,750,000	Aug. 1886 .25
124	Silverton, G. S. L	Colo.	2,000,000	200,000	10	*		76,000	Nov 1886 .02
125	Small Hopes Cons., s	Colo.	5,000,000	250,000	20	*		2,412,500	Nov. 1886 .20
126	Smuggler, s. L	Colo.	600,000	60,000	10			66,700	Aug. 1883 .25
127	Socorro, C	N. M.	250.000	4,000	100			4,000	Mch 1882 .00¼
128	South Yuba, G	Cal..	2,000,000	0,000	50	*		150,000	Oct. 1881 .75
129	Spring Valley, G	Cal..	200,000	2 0,000	1	50,000	Oct. 1886 .25	50,0 0	Jan. 1881 .25
130	Standard, G. S	Cal..	10 000,00	100,000	100	25,000	Oct. 1884 .25	4,425,000	Mar. 1884 .25
131	Stormont, s	Utah	500,0 0	500,000	1	*		155,000	Nov. 1881 .05
132	St. Joseph, L	Mo..	1,500,000	150,000	10	*		694,000	July 1886 .60
133	Syndicate, G	Cal..	10,000,000	100,000	100	38,729	July 1882 .15	48,308	Sept 1885 .10
134	Tip Top, s	Ariz.	10,000,000	100,0 0	100	250,000	Sept 1883 .25	100,000	Nov. 1881 .20
135	Tombstone, G. S. L.	Ariz	12,500,000	500,000	25	*		1,250,000	Apl. 1882 .10
136	True Fissure, G. S. L.	Utah	1,500,000	150,000	10	*		75,000	Jun. 1883 .15
137	United Verde, C	Ariz	3,000,000	300,000	10	*		97,500	Feb. 1884 .20
138	Valencia, M	N. H.	150,000	1,500	100	*		41,250	Apl 1886 2.50
139	Vizina, s	Ariz.	5,000,000	200,000	25	*		140,000	Apl. 1882 .10
140	Yankee Girl	Colo.	2,500,000	250,000	10			1,062,500	Oct. 1886 10
141	Yellow Jacket, G. S.	Nev..	12,000,000	120,000	100	5,448,000	Dec. 1885 .75	2,184,000	Aug. 1871 1.50

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Shares. Par Value.	Assessments. Total levied to date.	Assessments. Date and amount per share of last
1	Agassiz Cons., S. L.	Colo.	$2,500,000	50,000	$50	*	
2	Albion, S. L	Nev..	15,000,000	150,000	100	$577,000	July 1883 .50
3	Allouez, C	Mich	2,000,000	80,000	25	240,000	Feb. 1884 .50
4	Alpha Con., G. S.	Nev..	3,000,000	30,000	100	430,000	Mar 1886 .50
5	Alta, s	Nev..	10,080,000	100,800	100	1,976,300	Oct. 1886 .25
6	American Flag, S	Colo	1,250,000	125,000	10	300,000	Jun. 1877 .25
7	Anglo-Montana, Lt.	Mon.	600,000	120,000	5		
8	Appalachian, Lt., G.	N. C.	1,500,000	300,000	5		
9	Aspen Mg. & S, S. L	Colo.	2,000,000	200,000	10		
10	Barcelona, G	Nev..	5,000,000	200,000	25	*	
11	Battle Creek, G	Dak.	5,000,000	200,000	25		
12	Bear Creek	Cal..	300,000	300,000	1		
13	Bechtel Con., G	Cal..	10,000,000	100,000	100	173,500	n. 1883 .10
14	Belvidere	Cal..		60,000		92,000	b. 1882 .15
15	Belmont, S	Nev..	5,000,000	50,000	100	735,000	Apl. 1886 .10
16	Best & Belcher, G. S	Nev.	10,080,000	100,800	100	1,748,590	Sept 1886 .50
17	Big Pittsburg, S. L.	Colo.	20,000,000	200,000	100	*	
18	Bi-Metallic, S	Mon.	5,000,000	200,000	25	*	
19	Black Jack, G	Cal..	250,000	100,000	2½		
20	Bonanza Chief	Mon	1,000,000	1,000,000	1	*	
21	Bondholder	Colo	500,000	200,000	2½		
22	Boston Con., G	Cal..	10,000,000	100,000	100	170,000	Nov 1883 .25
23	Bradshaw, S	Ariz.	2,250,000	225,000	10		
24	Buckeye Common	Colo.	2,000,000	400,000	5	*	
25	Bull Domingo, S. L.	Colo.	10,000,000	200,000	50	*	
26	Bullion, G. S	Nev..	10,000,000	100,000	100	4,600,000	Aug. 1885 .30
27	Bye and Bye	Ariz.	1,000,000	100,000	10	*	
28	Calaveras, G	Cal..	500,000	500,000	1	*	
29	Catskill, S	Nev..	1,500,000	300,000	5		
30	Cen Contin'l, G. S. L	C & A	2,000,000	200,000	10	*	
31	Charles Dickens	Idah	1,250,000	250,000	5		
32	Cherokee, G	Cal..	1,500,000	150,000	10		
33	Chollar, S	Nev..	11,200,000	112,000	100	1,096,000	Nov 1886 .50
34	Cinnamon Mt., G. S	Colo.	750,000	150,000	5		
35	Climax, S. L	Colo.	2,000,000	200,000	10	*	
36	Colorado No. 2, S. L	Colo.	100,000	10,000	10		
37	Con. Imperial, G. S.	Nev..	50,000,000	500,000	100	1,100,000	Aug. 1886 10
38	Con. Pacific, G	Cal..	6,000 000	60,000	100	174,000	Feb. 1886 .15
39	Cons Silver, S	Mo..	2,500,000	250,000	10		
40	**Con. Queen Cons, C.	Ariz	1,400 000	140,000	10		
41	Courtlandt	Colo.	500,000	50,000	10		
42	Crescent, S. L	Colo.	3,000,000	300,000	10	*	
43	Crocker, S	Ariz.	10,000,000	100,000	100	65,000	May 1886 .20
44	Crowell, G	N. C	500,000	500,000	1		
45	Dahlonega, G	Ga..	250,0 0	250,000	1		
46	Dandy, S	Colo.	5,000,000	500,000	10		
47	Dardanelles, G	Cal..	1,000,000	100,000	10		
48	Decatur, S	Colo.	1,500,000	300,000	5	*	
49	Denver City, S. L	Colo.	5,000,0 0	500,000	10	*	
50	Denver Gold	Colo.	300,000	60,000	5		
51	Deseret, G S	Utah	500,000	50,000	10	*	
52	Dunderberg, S	Colo	1,500,000	150,000	10	*	
53	Durango, G	Colo.	500,000	500,000	1	*	
54	Durango T	Mex	120,000	1,200	100		
55	Eastern Dev. Co., Lt	N. S.	1,500,000	150,000	10	990,000	Mar. 1886 1.00
56	Elko Con., S	Nev..					Mar 1884 .15
57	Empire Lt., G	Mon.	500,000	100,000	5		
58	Empire, S	Utah	10,000,000	100,000	100		
59	Enterprise, S. L	Colo.	800,000	80,000	10	*	
60	Eureka Tunnel, S. L	Nev..	10,000,000	100,000	100	*	
61	Exchequer	Nev.	10,000,000	100,000	100	860,000	Oct. 1886 .20
62	Garfield, Lt., G. S	Nev.	500,000	100,000	5		
63	Gold Placer, G	Colo.	5,000,000	200,000	25	*	
64	Goodshaw, G	Cal..	10,000,000	100,000	100	229,314	Dec. 1885 .25
65	Grand Belt, C	Tex.	12,000,000	120,000	100	*	
66	Grand Duke	Colo.	800,000	80,000	10		
67	Gregory-Bobtail, G	Colo.	550,000	550,000	1		
68	Gregory Con., G	Mon.	3,000,000	300,000	10	*	
69	Harlem M. & M. Co, G.	Cal..	1,000,000	200,000	5		
70	Head Cent. & Tr. S. G	Ariz.	10,000,000	100,000	100		
71	Hidalgo, S	Mex.	200,000	20,000	10		
72	Highland, C	Mich	500,000	25,000	25		
73	Hortense, S	Colo.	2,000,000	200,000	10		
74	Iroquois, C	Mich	1,250,000	50,000	25		
75	J. D. Reymert	Ariz	10,000,000	100,000	100	*	
76	Julia Cons., G. S	Nev..	11,000,00	110,000	100	1,438,000	Nov 1885 .10
77	Kearsarge, C	Mich	1,250,000	50,000	25	100,000	Apl. 1886 5.00
78	Lacrosse, G	Colo.	1 00 000	100,000	10	*	
79	Lee Basin, S. L	Colo.	5,000,000	500,000	10	*	
80	Leviathan, S	Nev..	10,000,000	100,000	100	380,000	Sept 1882 .25
81	Lucerne, S	Colo.	5,000,000	500,000	10	*	Jan. 1885 .10
82	Mammoth Bar., G	Cal..	10,000,000	100,000	100	50,000	Dec. 1881
83	Mariposa pref., G	Cal..	5,000,000	50,000	100	1,687,500	Feb. 1883 .25
84	" common, G	Cal..	10,000,000	100,000	100	1,975,000	Dec. 1881 .20
85	May Belle, G	Cal..	10,000,000	100,000	100	84,000	Mar 1884 .15
86	Mayflower Gravel	Cal..	1,0 0,000	100,000	100	110,000	Nov. 1886 .25
87	Mexican, G. S	Nev.	10,000,000	100,800	100	2,565,760	Jun. 1886 .25
88	Mike & Starr, S. L	Colo	1,000,000	200,000	5	*	
89	Miner Boy, G. S. L	Colo.	5,0 0,000	500,000	10	*	
90	Miller	Nev	5,000,000	200,000	25		
91	Moose Silver, S	Colo.	3,000,0	300,000	10	*	
92	Nachoochee, Lt., G	Ga..	1,000,000	200,000	5		
93	New Pittsburg, S. L	Colo	2,000,000	200,000	10	*	
94	North Standard, G	Cal..	10,000,000	100,000	100	20,000	Nov
95	Noonday	Cal..	600,000	60,000	10	208,000	Dec. 1881 .10
96	Old Dominion, C	Ariz.	3,000,000	300,000	10		
97	Oriental	Nev..	2,000,000	200,000	10	*	
98	Oriental & Miller, S	Nev..	10,000,000	400,000	25		
99	Overman, G. S	Nev..	11,520,000	115,200	100	3,702,320	July 1886 .15
100	Parrott, C	Mon.	1,800,000	180,000	10		
101	Park, S	Utah	2,000,000	200,000	10		
102	Peer, S	Ariz.	10,000,000	100,000	100	135,000	Nov. 1886 .10
103	Peerless, S	Ariz.	10,000,000	100,000	100	295,000	Nov. 1886 .20
104	Potosi	Nev..	11,200,000	112,000	100	1,112,000	Nov. 1886 .30
105	Quin y	Colo.	3,000,000	300,000	10		
106	Rappahannock, G. S	Va..	250,000	250,000	1	*	
107	Red Elephant, S	Colo	500,000	500,000	1	*	
108	Robins, G. S	Colo.	5,000,000	200,000	25	*	
109	Ropes, G. S	Mich	2,000,000	80,000	25	63,200	Mar 1886 .10
110	S. P. & Canon del A. C.	N. M.	10,000,000	400,000	25	*	
111	Sheridan	N. M.	2,000,000	200,000	10		
112	Silver Cliff, S	Colo.	5,000,000	400,000	12½		
113	Sonora Con	Mex.	5,000,000	200,000	25	*	
114	South Bulwer, G	Cal..	10,0 0,000	100,000	100	100,000	May 1881 .25
115	South Hite	Cal..	10,000,000	100,000	100	195,000	Jan. 1883 .05
116	South Pacific	Cal..	500,000	100,000	5		
117	State Line, S	Nev..	250,000	250,000	1	*	
118	St. Louis & Mex., S.	Mex.	5,000,000	500,000	10	*	
119	St. Louis & St Elmo	Colo.	2,000,000	200,000	10		
120	St. L & St. Felipe, G. S.	Mex.	1,500,000	150,000	10		
121	St. L & Sonora, G. S.	Mex.	1,500,000	150,000	10		
122	St. Louis & Yavapai	Ariz.	3,000,000	300,000	10		
123	Sunday Lake, I	Mich	1,250,000	50,000	25		
124	Sullivan, G. S. L	Me...	500,000	100,000	5	125,000	Dec. 1882 .25
125	Sutro Tunnel	Nev..	20,000,000	2,000,000	10	*	
126	Tamarack, C	Mich.	1,000,000	40,000	25	520,000	Apl. 1885 3.00
127	Taylor-Plumas, G	Cal..	1,000,000	200,000	5	*	
128	Tioga Cons., G	Cal..	10,000,000	100,000	10	*	
129	Todos Santos, S	Mex.	1,000,000	100,000	100	325,000	Oct. 1882 .10
130	Tuscarora, S	Nev.	10,000,000	100,000	100	110,00	Oct. 1881 .15
131	Unadilla, S	Colo.	50,000,000	500,000	100		
132	Union Con., G S	Nev..	10,000,000	100,000	100	2,110,000	Nov. 1886 .25
133	United M. Lundy, G.	Cal..	1,000,000	200,000	5		
134	Utah, S	Nev..	2,000,000	200,000	100	1,830,000	Nov. 1886 .50
135	Vandewater	Nev.,	20,000,000	200,000	100	*	
136	Washington	Ariz.	2,000,000	200,000	10		
137	Wellington, G	Nev..	100,000	50,000	2	*	
138	West Granite Mt., S.	Mon	5,000,000	500,000	10	*	
139	Whalen Copper	Nev..	2,500,000	100,000	25		
140	Whittier Dr'e Bull'n	Nev..	1,000,000	100,000	10		

G. Gold. S. Silver. L. Lead C. Copper. * Non-assessable. † This company, as the Western, up to Dec. 10th, 1881, paid $1,400,000. ‡ Non-assessable for three years. § The Deadwood previously paid $275,000 in eleven dividends, and the Terra $75,000. Previous to the consolidation in Aug., 1881, the California had paid $31,320,000 in dividends, and the Con. Virginia $42,399,000 * Previous to the consolidation of the Copper Queen with the Atlanta, Aug., 1885, the Copper Queen had paid $1,350,000 in dividends.

NEW YORK MINING STOCK QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Nov. 27.		Nov. 29.		Nov. 30.		Dec. 1.		Dec. 2.		Dec. 3.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alice, Mon	1.60	.....	.....	.....	1.55	1.50	1.50	.....	1.75	1.40	1.75	.....	3,400
Amie Con., Co	.03	.....	.03	.02	.03	.....	.03	.....	.10	.03	.12	.07	189,300
Argenta, Ne	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bassick, Co	.....	.....	.30	.26	.35	.29	.35	.50	.....	.....	.38	.24	10,525
Belle Isle, Ne	.31	.....	.....	.....	42	.39	.....	.....	.90	.46	.90	.80	4,200
Bodie Cons., Ca	3.00	2.80	3.00	2.90	3.75	3.40	3.90	3.70	4.50	4.25	4.50	4.25	3,280
Breece	.....	.....	.....	.....	.40	.35	.....	.....	.60	.50	.60	.55	5,000
Bulwer, Ca	1.25	.....	.....	.....	1.75	.....	2.00	.....	2.15	2.00	2.05	.....	3,411
Caledonia	1.25	.....	1.30	1.25	1.40	1.35	.....	.....	1.65	1.40	1.45	1.35	1,250
Chollar	.....	.....	.....	.....	.....	.....	.....	.....	11.00	.....	5.00	.....	300
Crysolite, Co	.74	.....	.76	.75	.78	.66	.77	.75	.85	.....	.92	.85	4,300
Colorado Central	2.85	2.75	2.90	2.85	3.00	.....	.....	.....	3.00	2.90	2.95	2.90	3,560
Cons. Cal. & Va., Ne	22.50	....	34.00	.. ..	31.87	31.00	41.00	36.50	48.00	47.00	44.00	40.00	952
Crown Point	.....	.....	.....	.....	.....	.....	5.50	.....	.....	.....	.....	.....	100
Deadwood	3.00	.....	2.90	.. ..	3.25	3.10	3.40	3.15	.....	.....	3.15	2.95	1,900
Dunkin	.41	.....	.43	.....	.42	.....	.41	...	.42	.....	.....	.....	900
Eureka Cons., Ne	.....	.....	.....	.....	.....	.....	6.00	.....	10.00	9.50	9.50	8.00	625
Father de Smet, Dk	.....	.....	.....	.....	.....	.....	.90	.....	1.00	.....	1.00	.95	700
Freeland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gold Stripe, Ca	.....	.....	.05	.04	.05	.....	.07	.05	.09	.08	.09	.08	22,600
Gould & Curry, Ne	5.25	.....	.....	.....	.....	.....	9.00	.....	.....	.....	.....	.....	350
Green Mountain, Ca	.....	.....	.....	.....	.41	.40	.42	.....	.....	.....	.....	.....	700
Hale & Norcross, Ne	3.70	.....	5.50	.....	5.75	.....	7.00	.....	10.00	9.50	7.60	6.50	1,400
Helena	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Homestake, Dk	.....	.....	17.00	16.75	17.00	.....	16.00	.....	17.00	16.50	17.25	.....	900
Horn-Silver, Ut	.. ..	.....	.....	.....	2.00	1.90	2.05	1.90	2.00	1.90	1.70	.....	2,218
Independence	.07	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	800
Iron Hill	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iron Silver, Co	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Leadville C., Co	.....	.....	.....	.....	.70	.60	.68	.64	.80	.67	.73	.70	4,600
Little Chief, Co	.38	.34	.37	.35	.40	.35	.39	.....	.40	.30	.38	.35	12,300
Little Pittsburg, Co	.....	.....	.70	.....	.73	.71	.80	.75	.85	.80	.85	....	8,750
Martin White, Ne	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Navajo, Ne	.....	.....	.85	.....	1.10	.87	1.50	1.05	2.00	1.75	2.10	1.80	9,000
North Belle Isle, Ne	.. ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	6.00	.....	300
Ontario, Ut	.....	.....	.....	.. ..	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ophir	.....	.....	13.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Plymouth	.....	.....	.....	.....	.....	.....	16.38	.....	.....	.....	16.62	16.50	215
Potosi	.....	.....	.....	.....	.....	.....	9.00	.....	.....	.....	6.00	.....	120
Quicksilver Pref., Ca	24.50	.....	.....	.....	.....	.....	24.88	24.50	28.75	24.75	28.50	27.00	8,400
" Com., Ca	.....	.....	.....	.....	.....	.....	.....	.....	9.00	7.00	8.75	8.50	2,850
Quincy	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Robinson Cons., Co	.50	.....	.51	.50	.52	.....	.....	.....	.....	.....	.54	.50	2,000
Savage, Ne	.....	.....	10.00	.....	.....	.....	.....	.....	.....	.....	15.00	.....	210
Sierra Nevada, Ne	4.00	.....	5.75	5.25	9.00	6.75	14.00	11.00	13.50	.....	11.50	10.50	2,370
Silver King, Ar	.....	.....	6.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Spring Valley, Ca	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Standard, Ca	.. ..	.....	.. ..	.. ..	1.50	1.25	1.50	1.45	1.75	1.50	2.00	.....	2,050
Stormont, Ut	.....	.....	.....	.....	.14	.....	.19	.14	.19	.18	.22	.20	6,700
Tip Top, Ar	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yellow Jacket	3.60	3.50	4.15	4.00	5.50	5.00	.....	.....	12.00	.....	.....	.....	1,325

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Nov. 27.		Nov. 29.		Nov. 30.		Dec. 1.		Dec. 2.		Dec. 3.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Albion	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Alta	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
American Flag	.....	.....	.....	.....	.....	.....	.10	.....	.18	.10	.19	.14	54,350
Barcelona, G	.....	.....	.12	.....	.16	.....	.17	.. ..	.28	.21	.28	.26	7,600
Bechtel Con., G	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belvidere	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belcher	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Best & B'cher, G. S.	9.50	9.00	.....	.....	.....	.....	22.00	.....	.. ..	.....	23.25	.....	250
Big Pittsburg, S. L	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bradshaw	.....	.....	.....	.....	.....	.....	.25	.....	.....	.....	.06	.....	1,100
Bull-Domingo, S.L.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Castle Creek	.....	....	.19	.18	.19	.18	.21	.17	.22	.20	.20	....	8,300
Central Ariz'na, S.	.....	.....	.....	.....	.27	.15	.26	.19	.30	.25	.43	.25	19,120
Cons. Imperial	.....	.. ..	1.50	.....	1.50	.....	.....	.....	2.00	.....	.....	.....	500
Con. Pacific	.....	.....	.....	.....	.40	.....	.....	.....	.80	.12	.70	.....	600
Cusi	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Decatur	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Durango, G	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.04	.02	900
Eastern Oregon	.....	...	.02	....	.03	....	.10	.03	.08	.05	.06	.04	12,200
G ld Placer, G	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.10	.02	28,700
Hariem M. & M. Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Harshaw	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kossuth	.....	.....	.....	.....	.....	.....	.....	.....	.15	.....	.40	.....	1,100
Lacrosse, G	.13	.....	.....	.....	.16	.14	.15	14	.16	.14	.20	.15	26,300
Mariposa Pref., G.	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" Com., G	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mexican, G. S	.....	.....	8.25	7.00	.....	.....	11.25	.....	.....	.....	11.00	10.50	750
Mono	.....	.....	2.90	.....	3.50	3.25	3.50	3.40	4.25	.....	4.00	3.80	1,150
Navajo, 2 and 3	.....	.....	.....	.....	.....	.....	.07	.06	.....	.....	.....	.....	1,200
New Pittsburg	.....	.....	.....	.....	.28	.22	.36	.....	.50	.40	.....	.....	2,000
North Standard, G	.....	.....	.....	.....	.....	.....	.....	.....	.25	.24	.25	.....	900
N. Horn-Silv'r, S L	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ori'nt'l & Miller, S	.14	.....	.16	.15	.21	.20	.25	.20	.30	.22	.30	.23	13,700
Plutus	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rappahannock, G	.16	.12	.17	.15	.23	.17	.24	.23	.27	.23	.26	.22	174,300
Red Elephant, S.	.....	.....	.05	.03	.08	.06	.12	.07	.12	.10	.11	.10	36,600
" 2 and 3	.....	.....	.....	.....	.....	.....	.07	.05	.....	.....	.....	.....	400
Silver Cliff, S	.....	.....	.....	.....	.10	.09	.17	.11	.16	.13	.20	.16	20,000
Sonora Con	.....	.....	.....	.....	.....	.....	.....	..	.....	.....	.....	.....	.....
South Bodie, G	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Bulwer, G	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Hite	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Pacific	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
State Line, 1 & 4, S.	.....	.....	.....	.....	.....	.....	.07	.04	.12	.06	.09	.08	16,000
" Nos. 2 & 3, S.	.....	.....	.....	.....	.....	.....	.05	.04	.11	.07	.10	.07	21,100
Sutro Tunnel	.19	.18	.25	.21	.27	.24	.27	.23	.58	.27	.52	.44	677,150
Taylor Plumas	.25	.....	.35	.25	.50	.30	.....	.....	.45	.35	.45	.41	10,300
Tioga	.....	.....	.....	.....	.25	.....	.30	.....	.50	.35	.38	.....	700
Unadilla, S	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Union Cons., G. S.	3.75	.....	4.75	.....	6.00	.....	9.50	9.00	10.00	9.75	.....	.....	750
Utah	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

BOSTON MINING STOCK QUOTATIONS.

	Nov. 26.		Nov. 27.		Nov. 29.		Nov. 30.		Dec. 1.		Dec. 2.		SALES.
Amie	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Allouez	.....	.....	2.75	2.62	.....	.....	2.62	.....	2.50	.....	2.50	.....	1,100
Atlantic	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belle Isle	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bodie	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bonanza D	2.00	.....	.....	.....	2.00	.....	2.00	.....	2.00	1.75	2.06	1.87	3,775
Boston & Montana	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6.00	.....	150
Breece	.....	.....	.....	.....	.35	.....	.35	.....	.37½	.35	.35	.....	2,100
Bulwer	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Calumet & Hecla	225	.....	223½	222	221	.....	222½	221	.....	.....	220	.....	130
Catalpa	.42½	.40	.41	.40	.42	.37½	.32	... ..	.35	.33	.....	.....	3,800
Central	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Con. Virginia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dunkin	.40	.35	.40	.....	.....	.....	.41	.....	.41	.....	.....	.....	2,950
Eureka	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Franklin	16.25	16.00	16.00	.....	16.00	15.62	15.75	.. ..	16.50	16.00	17.00	16.87	2,610
Freeland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Grand Prize	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Honorine	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kearsage	.....	.....	.....	.....	.....	.....	9.00	.. ..	.....	.....	.....	.....	400
Ontario	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Osceola	27.00	26.00	26.50	26.00	26.00	25.50	25.50	.....	26.00	25.50	26.00	.....	1,095
Quincy	.....	.....	60.00	.. ..	.....	.....	.....	.....	.....	.....	.....	.....	15
Robinson	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Security	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Standard	.....	.....	.....	.. ..	.....	.....	.....	.....	.....	.....	.....	.....	.....
tormont	.....	.....	.13	.....	.....	.....	.....	.....	.13	.....	.....	.....	800

	Nov. 26.		Nov. 27.		Nov. 29.		Nov. 30.		Dec. 1.		Dec. 2.		SALES.
Arnold	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Aztec	.20	.12½	.....	.....	.20	.....	.....	.....	17½	.....	.....	.....	750
Bowman Silver	.09	.....	.....	.....	.....	.....	.08	.....	.09	.....	.....	.....	1,100
Cedar Spring	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
n. Pacific	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Copper Falls	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Crescent	.17	.....	.15	.....	.15	.....	.17	.....	.....	.....	.....	.....	1,500
"Cusi"	.....	.....	.....	.....	.....	.....	.45	.....	.45	.....	.....	.....	200
Empire	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hanover	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Humboldt	.30	.....	.....	.....	.....	.....	.33	.....	.....	.....	.....	.....	200
Huron	3.00	.....	2.87	.....	.....	.....	.....	.....	.....	.....	3.00	2.87	500
Mascot	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mesnard	.50	.....	.....	.....	.....	.....	.50	.....	.....	.....	.....	.....	825
Minnesota	.....	.....	2.00	.....	.....	.....	2.00	.....	.....	.....	.....	.....	200
National	.....	.....	.....	.....	.....	.....	1.62	.....	.....	.....	.....	.....	100
Native	.30	.....	.28	.....	.29	.....	.....	.....	.....	.....	.....	.....	700
Napa	.....	.....	.....	.....	.75	.....	.....	.....	.....	.....	1.00	.....	1,500
Oriental & Miller	.....	.....	.15	.....	.15	.14	.....	.....	.....	.....	.....	.....	2,000
Pewabic	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.75	.....	20
Ridge	.....	.....	1.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
South Side	.....	.....	.35	.....	.....	.....	.....	.....	27½	.....	.....	.....	400
Star	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sutro Tunnel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tamarack	.....	.....	.....	.....	.....	.....	.95	.....	.....	.....	.93	.....	60
Washington	.12½	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Winthrop	.15	.....	.....	.....	.....	.....	.17	.....	17½	.....	.....	.....	600

New York: Dividend shares sold, 323,761. Non-dividend shares sold, 1,141,420 Total New York, 1,465,181.
Boston: Dividend shares sold, 18,925. Non-dividend shares sold, 10,855. Total Boston, 29,780.

COAL STOCKS.

NAME OF COMPANY.	Par value of shares.	Nov. 27.		Nov. 29.		Nov. 30.		Dec. 1.		Dec. 2.		Dec. 3.		Sales.
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Barclay Coal	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cameron Coal	50	26½	25½	28	26	26¾	26	26	25	25⅞	25¼	25¾	25½	15,007
Col., C. & I	10	40½	39½	41	39½	40¾	39	40	38¾	41	40	40⅝	40	35,320
Ches. & O. RR	100	1²¼	.....	10	.....	9½	9¼	9⅞	9½	.....	.....	.....	.....	850
Consol. Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	28	.....	100
Cumb. C. & I	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Del. & H. C	100	106¼	105¼	106½	105¾	106⅛	104½	104½	.....	106¼	105⅛	106⅜	106	7,950
D., L. & W. RR	50	141⅞	140⅞	142⅝	141½	142⅜	141	142	140⅝	142½	141¾	141¾	141¾	170,130
Elk Lick Coal Co	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lehigh C. & N.†	50	51	50¾	51½	51	51¾	51¼	50⅜	50¼	50⅞	50⅛	.....	.....	8,943
Lehigh Valley RR.†	50	56½	.....	56¾	56⅝	57	56½	56¾	.....	57	56½	.....	.....	764
L. & W. C. & I. Co	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maryland Coal	100	18¾	18½	18⅞	.....	.....	.....	.....	.....	.....	.....	.....	.....	700
Montauk Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morris & Essex	50	.....	.....	.....	.....	.....	.....	142½	.....	.....	.....	.....	.....	70
New Central Coal	100	19	18½	.....	.....	18½	18	17½	17	18¼	.....	18	....	1,110
N. J. C. RR	100	51⅝	49¾	53	50¼	54¾	52¼	53½	52	54¼	53	54⅜	53⅛	167,779
N. Y. & S. Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Penn. Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Penn. RR.†	50	57⅝	.....	58⅛	57⅝	58	57½	57½	57¼	58⅛	57½	.....	.....	5,617
Ph. & R. RR.*	50	49⅝	44	52⅛	47½	53⅞	48½	50⅜	48½	50⅝	48¾	49½	47⅞	1,270,511
Spring Mountain	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tennessee C. & I. Co	.....	100	99	102	100	104	102¾	107	105	113	109	114	113	5,075
Westmoreland Coal†	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Of the sales of this stock, 130,016 were in Philadelphia, and 1,140,495 in New York.
† The quotations for these stocks are not percentage, but actual price. Total sales, 1,689,926.

Pilgrim Mining Company, office of M. Van Orden, Houghton, Michigan, December 11th, at three o'clock P.M., first meeting.

Silver King Mining Company, of Colorado, Room 52, No. 69 Wall street, New York City, January 27th, 1887, twelve o'clock M.

Silver King Tunnel Mining Company, No. 64 Beaver street, New York City, December 8th.

San Francisco Mining Stock Quotations.

NAME OF COMPANY.	CLOSING QUOTATIONS. Nov. 26.	Nov. 27.	Nov. 29.	Nov. 30.	Dec. 1.	Dec. 2.
Albion	.....	.....	.....	.....	.....	.....
Alpha	.....	.....	.....	.....	.....	.....
Alta	2.25	2.50	3.75	3.50	4.25	3.75
Argenta	.....	.....	.....	.....	.....	.....
Bechtel	.....	.....	.....	.....	.....	.....
Belcher	.....	.....	.....	.....	.....	.....
Belle Isle	.....	.....	.....	.....	.....	.....
Best & Belcher	7.25	12.25	16.75	18.00	27.00	23.00
Bodie	2.75	2.75	3.50	4.00	4.00	4.00
Bulwer	1.62½	1.50	1.62½	2.00	2.25	2.12½
Chollar	3.87½	4.50	6.25	6.75	8.50	5.75
Con. Pacific	.....	.....	.....	35.00	40.00	45.00
Con. Cal. & Va.	19⅞	35.00	34.00	39.00	48.00	41.00
Crown Point	2.25	2.25	3.37½	4.87½	8.37½	4.75
Eureka Cons	5.25	5.50	5.25	5.87½	9.50	9.00
Gould & Curry	4.00	5.00	7.12½	8.25	12.50	8.75
Grand Prize	.....	.....	.....	.....	.....	.....
Hale & Norcross	3.12½	3.75	5.37½	6.25	9.25	7.50
Martin White	.....	.....	.....	.....	.....	.....
Mexican	4.75	6.12½	7.87½	8.75	14.25	10.75
Mono	2.75	2.75	3.62½	3.25	3.75	4.00
Mount Diablo	.....	.....	.....	.....	2.62½	3.62½
Navajo	.70	.75	.80	1.00	1.12½	2.25
Northern Belle	.....	.....	.....	.....	.....	.....
North Belle Isle	.....	.....	.....	.....	.....	.....
Ophir	9.87½	12.50	15.00	19.00	30.50	25.00
Potosi	4.75	5.00	7.00	7.12½	10.50	6.87½
Savage	6.62½	7.50	10.25	14.50	17.00	15.75
Scorpion	.....	.....	.....	.....	.....	.....
Sierra Nevada	3.75	5.37½	7.12½	10.25	14.00	11.25
Silver King	.....	.....	.....	.....	.....	.....
Tip-Top	.....	.....	.....	.....	.....	.....
Union Cons	3.00	3.87½	5.75	7.62½	10⅜	9.50
Utah	.....	.....	3.75	6.00	7.50	10.75
Yellow Jacket	3.25	3.75	5.50	7.37½	11.75	6.50

Dividends.

Bellevue-Idaho Mining Company, of Idaho, has declared dividend No. 11, of ten cents a share, or $12,500, payable November 30th, at Salt Lake City.

Charleston (S. C.) Mining and Manufacturing Company has declared a quarterly dividend of two dollars and fifty cents a share, and an extra dividend of one dollar a share, payable on the 1st inst., at Philadelphia, Pa.

Granite Mountain Mining Company has declared dividend No. 24, of twenty-five cents a share, or $100,000, payable December 1st, at St. Louis.

Saginaw Valley Land and Mineral Company has declared a final dividend of 8½ cents a share, in liquidation, payable November 24th, at No. 163 Broadway, New York City, on surrender of the certificates of stock for cancellation.

Kentuck Mining Company, of Nevada, has declared dividend No. 50, of ten cents a share, or $3000, payable this month, at San Francisco.

DIVIDENDS PAID BY MINING COMPANIES DURING THE MONTH OF NOVEMBER AND FROM JANUARY 1ST, 1886.

NAME OF COMPANY.	Location	Paid in November.	Since Jan. 1st.
Adams, S. L	Colo.	$22,500	$225,000
Alice, G. S	Mont.		75,000
Amy & Silversmith, S.	Mont.	34,142	170,750
Atlantic, C.	Mich.		40,000
Bellevue-Idaho, S. L.	Idaho	12,500	62,500
Big Bend Hydraulic, G.	Dak.	6,000	60,000
Boston & Montana, G. S.	Mont.		180,000
Brooklyn Lead, L.	Utah		20,000
Caledonia, G.	Dak.		20,000
Calumet & Hecla, C.	Mich.	500,000	1,500,000
Central, C.	Mich.		40 000
Colorado Central, S.	Col.		83,750
Cons. Cal. & Va., G. S.	Nev.		64,800
Crescent, G. S. L	Utah		30,000
Derbec Blue Grav., G.	Cal.		40,000
Elkhorn, G. S.	Mont.	5,000	55,000
Franklin, C.	Mich.		40,000
Freeland, G. S. C.	Colo		60.000
Granite Mt., S	Mont.		920,000
Hecla Con., G. S. L. C.	Mont	15,000	165.000
Helena Mg. & R., G. S. L. C	Mont.		59,670
Holmes, S.	Nev		75,000
Homestake, G.	Dak.	50,000	550.000
Honorine, S. L	Utah		12,500
Idaho, G.	Cal	15,500	170,500
Idahoan, S	Idaho.		92,000
Ideal, S. L.	Colo.		15,000
Iron Hill	Dak.		112,500
Iron Silver, S. L.	Colo.		200,000
Jackson, G. S.	Nev.		20,000
Leadville Cons., S. L.	Colo		40,800
Manhattan, S	Nev.		25,000
Martin White, S	Nev.		25,000
Mono, G.	Cal.		12,500
Montana, Lt., G.	Mont.		653,400
Morning Star, S. L	Colo.		100,000
Moulton, G. S.	Mont.		60,000
Ontario, S.	Utah	75,000	825.000
Paradise Valley, G. S.	Nev.		80,000
Peacock, G. S. C.	N. Mex.		60,000
Plumas-Eureka, G	Cal		52,729
Plutus, G. S. C.	Colo.		20,000
Plymouth Con., G	Cal.	25,000	275.000
Quicksilver Pref., Q.	Cal.		118,250
Quincy, C	Mich.		240,000
Richmond, S. L	Nev.		67,500
Robinson Con., S.	Colo.		10,000
Sierra Buttes, C.	Cal		76,562
Silver King, S.	Ariz.		200,000
Silverton, S.	Colo.	4,000	44,000
Small Hopes Con., S. L.	Colo.	50,000	637,500
St. Joseph, L.	Mo		65,000
Valencia, M.	N. H.		3,750
Viola, S. L.	Idaho.	42,500	42.500
Yankee Girl	Colo	25,000	250,000
Young America, G.	Cal.		165,000
		$882,142	$9 338,661

G., Gold; S., Silver; L., Lead; C, Copper; Q., Quicksilver; M., Mica.

St. Louis Mining Stocks. Dec. 1.

[From our Special Correspondent.]

This week's market was significant in the depreciation of values in the stocks of companies that have been floated on "reports," and that have not "panned out" as anticipated. The greatest decline was in Sheridan, which sold from $7.50 down to $3.50 a share, with no support even at the latter figures. None of the stocks on this market has been so persistently "bulled," and no property so enthusiastically reported on as the Sheridan for the past four months; hence, when the mill got fairly to work, and did not show "results," there was a scramble to sell, with the effect as stated. On the other hand, good stocks have not only held their own, but are firmer than last week. Granite has been sought after, but as sellers are "few and far between," the transactions were insignificant. A "call" on 1000 shares of this stock at $60 a share (six months) was sold for 1½ per cent. Hope has been strong at $46¼. We look for higher prices on both Granite and Hope.

The "call" at our Merchants' Exchange for mining shares is assuming larger proportions constantly, and promises eventually to become quite an important factor, although so far, at least, the greatest activity has been in so-called "fancy" cheap stocks. Thus far, only four mines have been listed, but applications of others are before the Board of Directors, who have, however, concluded to impose more stringent conditions hereafter, to entitle mining shares to the privilege of the call. Until these conditions and rules are determined on, no new stocks will be admitted. The shares at present called are: Granite Mountain, Sheridan, Mexican Improvement, and Ideal. The question of a Mining Exchange is spoken of, but nothing definite has as yet been concluded.

NAME OF COMPANY.	Location.	Bid.	Asked.
Adams, S. L	Colo.	$5.50	$6.15
Bi-Metallic, S.	Mont.	.....	.....
Cen. Continental, G. S.	Ark.	.....	.....
Consolidated Silver, S.	Mo.	.....	.....
Courtland	Colo.	.....	.25
Dandy, S.	Colo.	.....	.....
Durango, T.	Mex	.....	.....
Grand Duke	Colo.	.....	.....
Granite Mountain, S.	Mont.	49.50	50.00
Hope, S	Mont.	47.50	50.00
Ideal, S. L	Colo.	1.20	1 30
Iron Gold and Silver	.....	.45	.55
Laclede	.....	.55	.70
Mexican Improvement	Mex.	1.55	1.65
Peacock	N. M.	2.50	2.75
Puritan	Colo	.....	.25
Quincy	Colo.	.....	.15
Sheridan	N. M.	3.75	4.00
Small Hopes Cons., S. L.	Colo.	8.25	9.00
St. Louis & Mexican	Mex	1.95	2.10
St. Louis & San Fran.	Mex.	.....	.....
St. Louis & Sonora, G. S.	Mex	.....	.20
St. Louis & St. Elmo	Colo.	.....	.45
St. Louis & Yavapai	Ariz	1.10	1.20
West Granite, S	Mont.	.....	1.60

Pipe Line Certificates.

Messrs. Watson & Gibson, brokers, No. 49 Broadway, report as follows for the week:

The petroleum market sold up to 81¼ cents, showing an advance of 15 cents within about three weeks. Light stocks of oil in Europe, increasing bullishness of the field situation, and the increasing bull temper of speculative circles generally, explain the advance.

The trade have recently been watching a new well in Beaver County, Pa., south of Pittsburg, which was feared as a dangerous "wild-cat," but it appears to be a small affair. There are less new wells drilling than any time in two years, and the chances favor a daily average production on January 1st next of 65,000 barrels, against 75,000 average consumption upon reactions. We think the market a purchase.

The following table gives the quotations and sales at the Consolidated Stock and Petroleum Exchange:

	Opening.	Highest.	Lowest.	Closing.	Sales.
Nov. 27.	78¼c.	78½c.	77½c.	77⅞c.	3,312,000
29.	78¼	78½	77⅝	77⅞	2,113,000
30.	78	79⅛	77½	78¼	4,767.000
Dec. 1.	78	79⅛	78	79¼	4,556,000
2.	79¾	81⅜	79⅝	80½	4,750,000
3.	81½	81⅞	80⅜	81⅛	3,912,000
Total sales in barrels (40 gallons)					23,410,000

Boston Copper and Silver Stocks.

[From our Special Correspondent.]

BOSTON, Dec. 2.

There has been a slight falling off in the volume of business the past week, and prices for copper stocks have tended to a lower basis, although no large amounts are pressing on the market, and we believe that, with a renewal of activity, sure to follow during the winter months, much higher prices will prevail, especially for the producing mines, while the low-priced and non-productive stocks will be largely dealt in, and good opportunity offered to make money in this class of stocks. In the early dealings, Calumet & Hecla was quite strong at $225; but later, there seemed to be a lack of orders, and it declined to $221, with one share sold to-day at $220. Tamarack sold at $95, which is an advance of $3 over the last sale. Franklin declined to $15⅝, but is in much better request to-day, selling up to $17, with 16¾ bid. Only a small lot of Quincy sold at $60, same as last week. Osceola has been quite active at $26@27, although at one time it sold down to $25½ on forced sale of about 100 shares, closing to-day at $26, same as last week. Allouez declined to $2½; and Kearsarge, from $9½@$9. Huron sold at $2⅛@$3. Pewabic sold at $2¾. Mesnard, at 50c. South Side, at 35c. The sales for the week comprise 130 Calumet & Hecla 50 Tamarack, 2360 Franklin, 1035 Osceola, 800 Allouez, 400 Kearsarge, 20 Pewabic, 625 Mesnard, 300 South Side, and 200 Huron. Total, 5920 shares.

The boom in the local silver stocks noted last week seems to be about over for the present. Catalpa declined to 35c. Crescent, to 15c. Dunkin, 35@40c. Bonanza, $1¾. Napa Quicksilver sold at 75c., but was stronger to-day, selling up to $1. Bonanza was also more active, with sales at $2@$2 1-16.

CONTRACTS OPEN.

100 STEEL GUN-FORGINGS AND ARMOR—Proposals will be received by the Secretary of the Navy, Navy Department, Washington, D. C., until March 15th, 1887, for about 1310 tons of steel gun-forgings, and about 4500 tons of steel armor plates.

116 WATER-WORKS—SEALED PROPOSALS for the construction of works for the water supply of the city of Portland, Oregon, will be received at the office of the Water Committee, Portland, Oregon, until 12 M., December 15th, 1886. These works will be constructed according to the printed specifications dated August 24th, 1886, and will include thirty-one miles of wrought-iron pipe, 27 and 22¼ inches in diameter; three iron bridges; two thousand feet of submerged pipe under and across the Willamette River; a reservoir within the city limits, and all other works described in the specifications, excepting those specified as "Head-works," which are now under contract. The specifications provide that the wrought-iron pipes shall be made of iron sixty inches in width, but proposals will also be received for furnishing the iron, and for manufacturing the entire length of pipe, of iron either forty-two, forty-eight, or sixty inches in width. Proposals will also be received for the construction of all the works described in the specifications, excepting the Head-works, for a lump sum, the contractor being at liberty to use iron for the pipes either forty-two, forty-eight, or sixty inches in width, the whole work to be completed within eighteen months after signing the contract. In these modified forms of proposals the width of iron proposed will be stated in the bids, and a copy of this advertisement will be attached to each bid. The proposals will be indorsed on the outside of the sealed envelope, "Proposals for Construction of Water-Works," and addressed to Philip C. Schuyler, Clerk of the Water Committee, Portland, Oregon. The specifications and such further information as may be required will be furnished on application by ISAAC W. SMITH, Engineer of the Water Committee, Portland, Oregon.

135 BROWN STONE AND MARBLE—PROPOSALS will be received by M. E. Bell, Supervising Architect, Treasury Department, Washington, D. C., until December 8th, for furnishing and setting all the brown stone and marble required for the Court-House, etc., at Rochester, N. Y.

136 DREDGING JETTIES, ETC.—PROPOSALS will be received by Lieut-Col. William. P. Craighill, U. S. Engineer Office, 905½ East Main Street, Richmond, Va., until December 8th, for dredging and excavating rock from the channel of the James River, near Richmond, Va., for the construction of mattress-dikes, and for the construction and extension of jetties.

137 JETTIES—PROPOSALS WILL BE received by Lieut. W. M. Black, U. S. Engineer Office, Jacksonville, Fla., until December 11th, for the construction of jetties at the mouth of Saint John's River, Florida.

138 SUPPLIES—PROPOSALS WILL BE received by Lieut.-Col. O. M. Poe, U. S. Engineer Office, 34 West Congress Street, Detroit, Mich., until December 13th, for furnishing one dredge, one tug, and two dump scows; iron drift bolts and spikes; framing, placing, filling, and completing crib piers; and furnishing and placing puddling clay.

139 MACHINERY AND SUPPLIES—PROPOSALS will be received by the Piedmont Reduction Company, of North Carolina, 115-123 Chestnut Street, Newark, N. J., for the following articles: Fire-bricks and tiles, fire-clay, red bricks, lime, and cement, ore-breaker and crushing-rolls, edge-runner mixing mill, iron-work for water-jacket blast-furnace, blower and air pipes, slag-pots, molds, and tools, blacksmith's forge and tools.

141 DREDGING—PROPOSALS WILL BE received by Lieut.-Col. G. L. Gillespie, U. S. Engineer Office, P. O. Box 5346, Room 124, P. O. Building, Boston, Mass., until December 8th, for dredging and removing from Fort Point Channel, Boston Harbor, Mass., about 60,000 cubic yards of material.

142 EXCAVATING — PROPOSALS WILL be received by Lieut.-Col. O. M. Poe, U. S. Engineer Office, 34 West Congress street, Detroit, Mich., until December 16th, for excavating at Middle Neebish, Hay Lake Channel, Michigan.

143 DREDGING—PROPOSALS WILL BE received by Lieut.-Col. D. C. Houston, U. S. Engineer Office, Room 59, Army Building, corner Houston and Greene streets, New York, until December 18th, for dredging in Stamford Harbor, Conn.

146 PROPOSALS WILL BE RECEIVED AT the War Department, Surgeon-General's Office, Washington, D. C., until December 20th, for the construction and erection of an iron book-stack and for cast-iron file cases.

147 DREDGING—PROPOSALS WILL BE RECEIVED by Capt. James B. Quinn, U. S. A., Duluth, Minn., until December 13th, for dredging in Superior Bay and Saint Louis Bay, Wis, and in the harbor of Grand Marais, Minn.

148 DREDGING—PROPOSALS WILL BE received by Lieut. W. M. Black, U. S. Engineer Office, Jacksonville, Fla., until December 22d, for dredging in Apalachicola Bay and at the mouth of the Carabello River, Fla.

149 STEAM-BOILER—PROPOSALS WILL be received by Major W. H. Heur, U. S. Engineer, New Orleans, La., until December 18th, for a steam-boiler for U. S. Steamer Arbutus.